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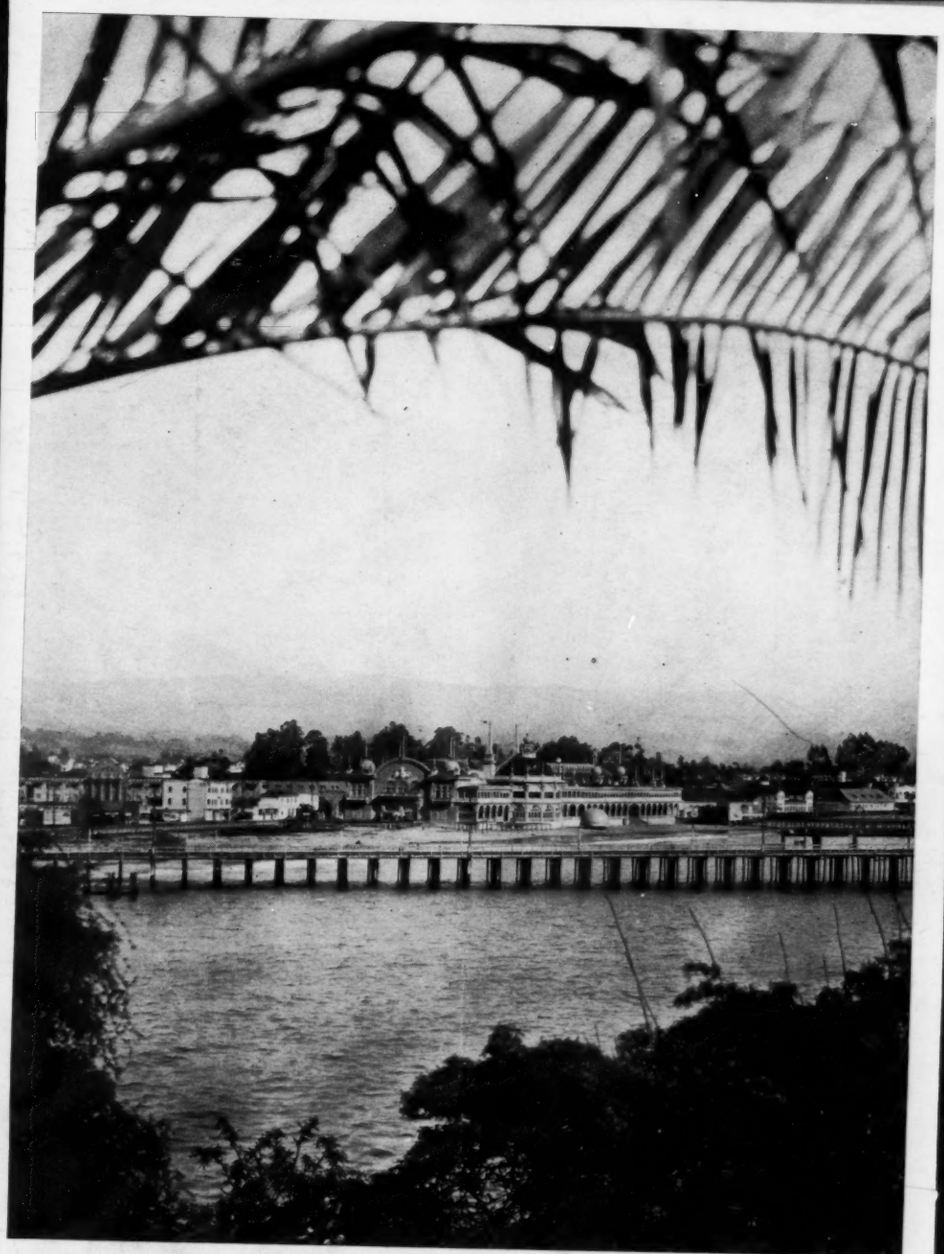

A seaside glimpse of beautiful Santa Cruz, California, where the Pacific Coast Gas Association meets this year in its thirty-fourth annual convention, September 12-16

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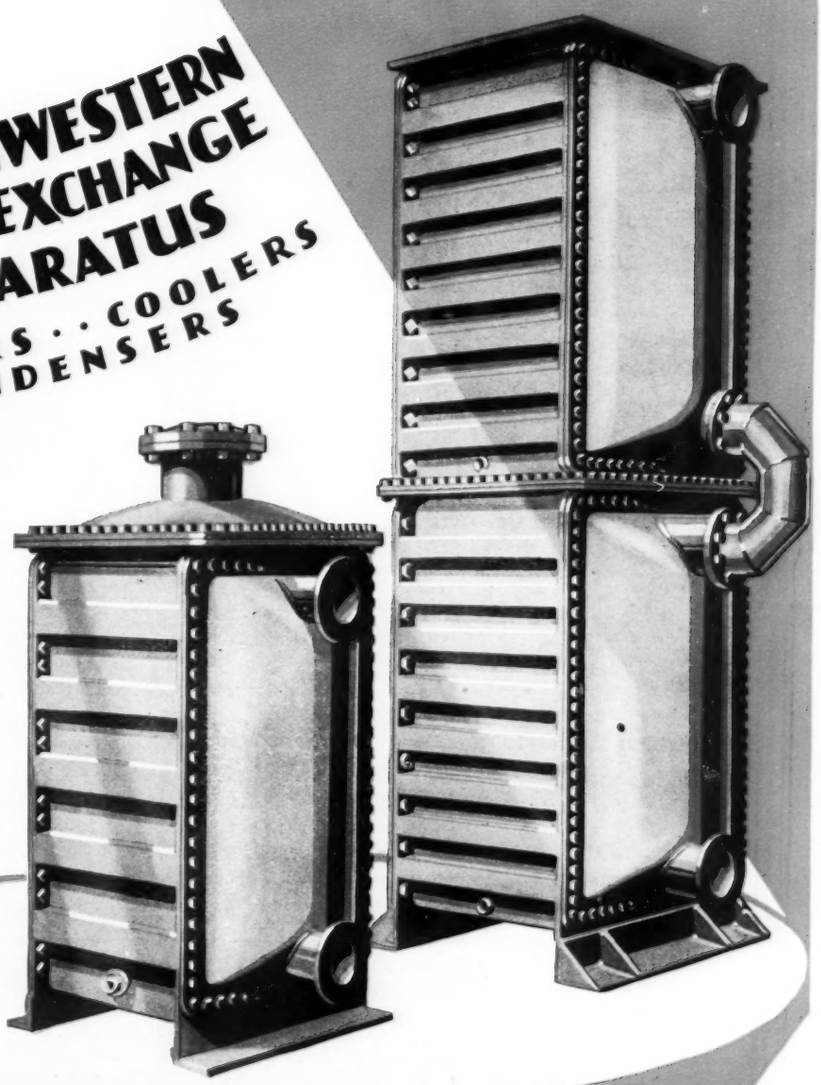

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Official Publication Of The
Pacific Coast Gas Association

Contents for August

Santa Cruz, Convention Headquarters, Pacific Coast Gas Association ..... *Cover*

Selling the Utility to the Users of Its Service 21
By J. Earl Jones

Give the Meter a Chance 23
By K. C. Tomlinson

Firing Face Brick 24
By Lee Holtz

Large and Small Industrial Users Get Equal Consideration in Oklahoma City 26
By Logan W. Cary

Master Meters Bring Gain in Denver Apartment Gas Use and Revenue 27
By Roy G. Munroe

Servicing Appliances Is Good Will Agency 29
By J. E. Kelley

Benzol Manufacture at Portland, Oregon 30
By N. H. Wardale

World's Largest Stripper Plant Now Operates at Saticoy, California 32
By Eugene Tays

Pacific Coast Gas Association 34

Editorial 36

Plant Inspection Makes for "Good Housekeeping" on Standard Gasoline Properties 37
By B. F. Masten

$25 Shares Give Impetus to Customer Ownership Activity in the West 38
By George H. Finley

This Month's Patents Pertaining to the Industry 39

Meeting Two Practical Automotive Problems 40
By H. W. Drake

Truckee River Power Company Exhibits Gas Appliances at Reno Exposition 42
By Joseph T. Sullivan

Natural Gas Gasoline Operations 58

JAY JENKINS, *Publisher*
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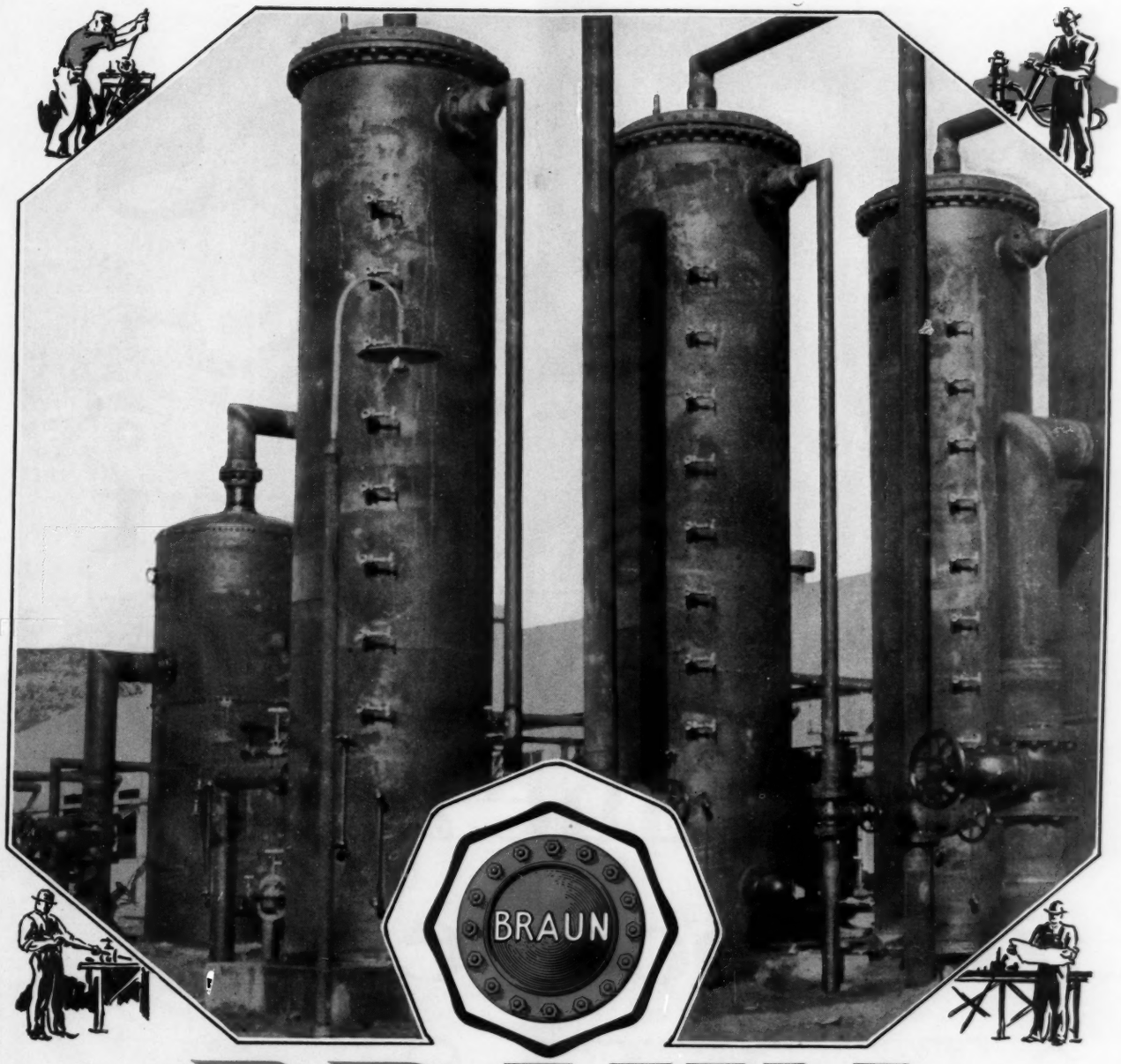

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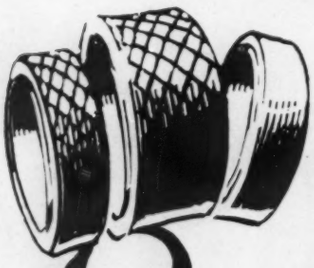

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PHOTOGRAPH showing part of a cast iron pipe installation at Chicago, Illinois.

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Discard, *old expensive* tapping machines

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The Mueller Tapping Machine "L," illustrated, offers the one sure solution for pipe-tapping problems. It is designed for making taps of ⅜ to 2 inches in any size pipe from 2 to 48 inches, under pressure, in the least time and with the least expenditure of effort.

It has a heavy brass body, cast steel gooseneck, malleable iron chain yoke, and is equipped with Mueller Oiling Device. A joint is made with the pipe by the use of a rubber gasket and a malleable iron saddle. The gooseneck is swiveled to the body, thus permitting the operator to turn it around to whatever position is most advantageous. The ratchet handle allows operating in even the closest quarters. All parts and accessories are made of the finest materials available, assuring long life for the entire machine.

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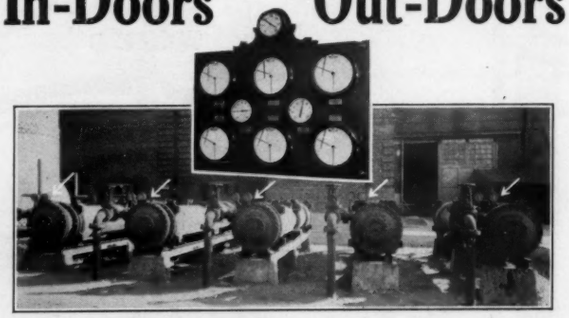

Foxboro Instruments Everywhere in the Gas Plant

One of the largest gas companies on the Pacific Coast not only uses Foxboro Instruments extensively inside its plant but for outside work as well. Because Foxboro Instruments are superior in quality they are equal to the test.

The Foxboro Thermometers, top photograph, record the temperature of the gas to and from the After-Coolers, shown in the lower photograph, water supply and outlet temperatures. The gauges indicate water pump pressures. Photograph below shows Foxboro Indicating Thermometers installed outside on the Braun After-Coolers.

Foxboro Instruments for gas plant service perform so accurately and dependably because they are built to do a specific job. They are guaranteed permanent in calibration and are accurate to within less than 1 per cent of total scale range. Get in touch with the nearest Foxboro Branch Office.

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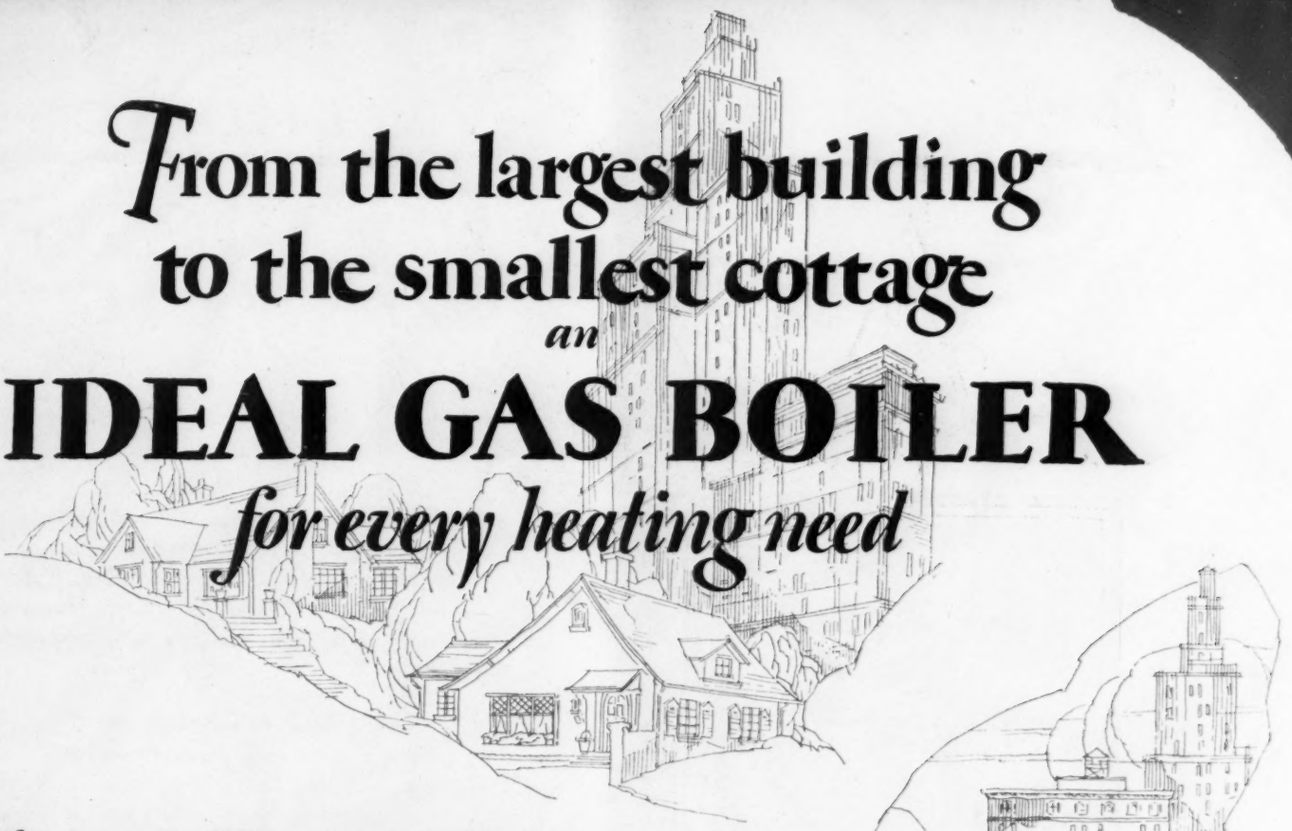
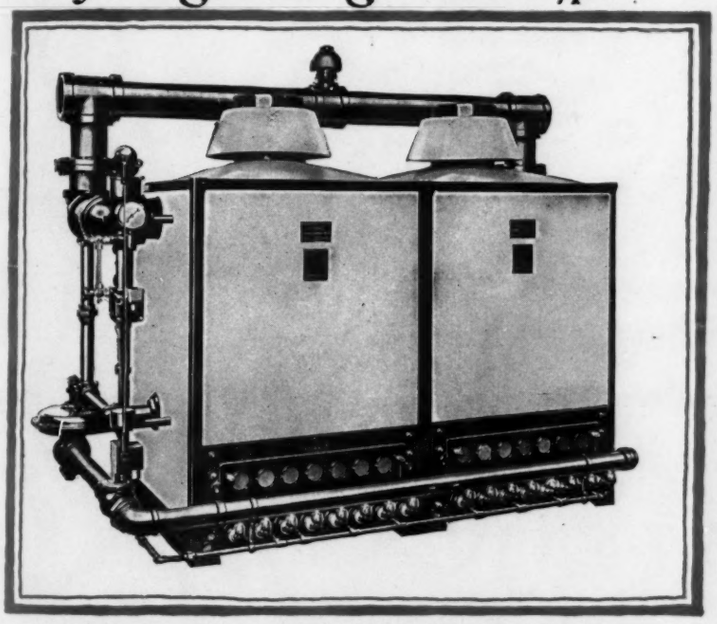


1-*for large buildings*-IDEAL *type* 4-G

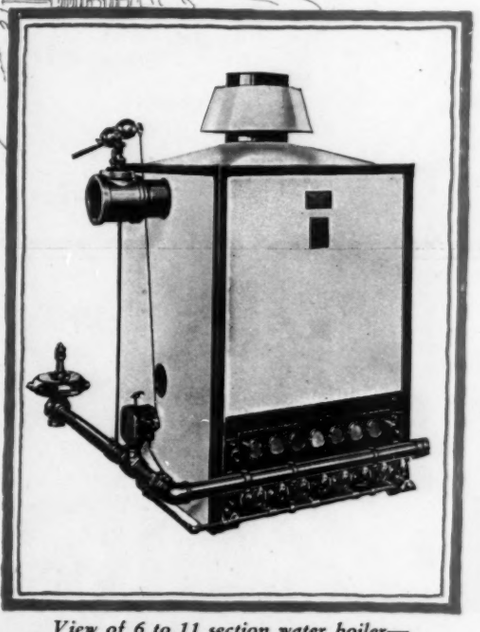


View of 14 to 22 section steam boiler fully equipped. Furnished with snap action or throttling control.

THESE boilers, designed fundamentally for big installations, are the most compact for their rated capacity on the market, irrespective of fuel used.

A low water line of only 43" and a medium number of burners of large capacity simplify adjusting and cleaning. In addition, the largest assembly contains but two flue connections, two outlets and two returns of adequate size to handle the rated output with normal velocity of flow.

Ideal type 4-G boilers are insulated with smooth asbestos panels, black vitreous enamel trim and with gray vitreous enamel canopies and draft diverters, giving a durable and permanently attractive appearance.



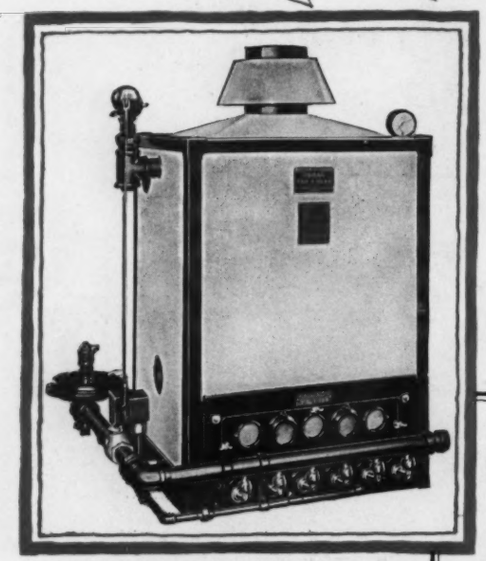
View of 6 to 11 section water boiler—fully equipped. Furnished with snap action or throttling control.

Sizes—Ratings

Boiler Number	A. G. A. Rating	
	Steam	*Water*
4-G-6	2000	3250
4-G-7	2400	3900
4-G-8	2800	4550
4-G-9	3200	5200
4-G-10	3600	5850
4-G-11	4000	6500
4-G-14	4800	7800
4-G-16	5600	9100
4-G-18	6400	10400
4-G-20	7200	11700
4-G-22	8000	13000

2 FOR RESIDENCES

IDEAL *type 1-G*



View of 7 section water boiler —fully equipped. Furnished with snap action or throttling control.

THIS is the standard gas-fired boiler for all general house heating requirements and for hot water supply. The culmination of years of research, it is highly efficient, simple in operation, automatic in control, and economical of gas.

Like all Ideal Gas Boilers the Type 1-G is fully equipped with positive mechanical automatic controls for steam, water and vapor, including thermostatic pilot, and is regularly supplied with vitreous enamel canopy and draft diverter and asbestos insulated jacket.

In every respect this gas boiler offers your customers a sound investment in heating equipment. It is a fitting product around which to build a successful heating sales campaign.

Sizes—Ratings

Boiler Number	A.G.A. Rating	
	Steam	*Water*
1-G-4	525	900
1-G-5	700	1200
1-G-6	875	1500
1-G-7	1050	1800
1-G-8	1225	2100
1-G-9	1400	2400
1-G-10	1575	2700
1-G-11	1750	3000
1-G-13	2100	3600
1-G-15	2450	4200

Why most Gas Companies merchandise IDEAL GAS BOILERS

1. Manufactured by a world leader in the heating industry—tested and rated according to A. G. A. code—approved by leading gas company laboratories.

2. Easier to sell because of wide public recognition of the trade name "Ideal" as standing for the best in heating equipment. Commands the respect of architects and builders—accepted without question by the heating trade.

3. The only *complete* line of gas boilers on the market offering a range of standard types and sizes for every requirement.

4. Fully equipped with all accessories and complete automatic controls specially designed for Ideal Gas Boilers only. No extras—nothing else to buy.

5. Complete cooperative advertising service to promote local sales.

Made by the AMERICAN RADIATOR COMPANY

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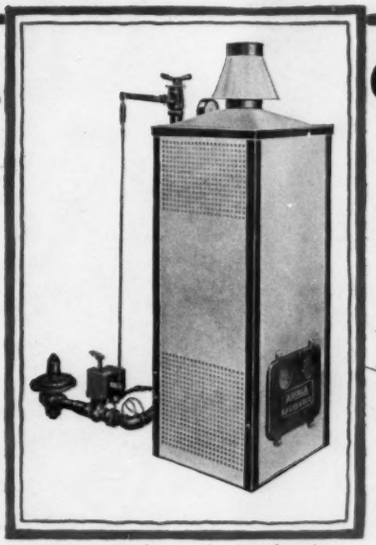
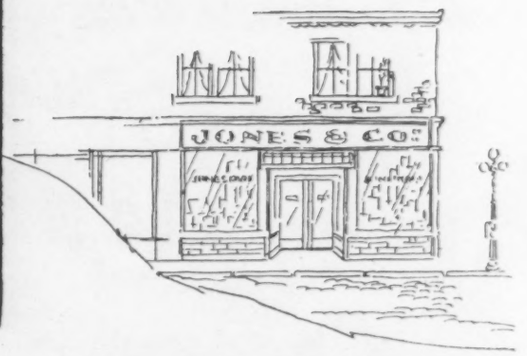
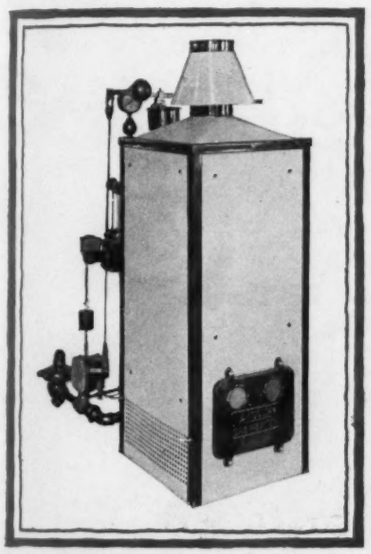
IDEAL ARCOLA GAS HEATERS



With Parlor (uninsulated) jacket and complete No. 797 water equipment.

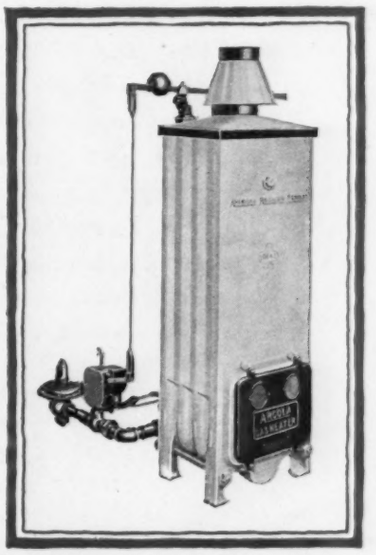




With insulated jacket and complete No. 800 steam equipment.

Sizes—Ratings

Heater Number	A. G. A. Rating	
	Steam	*Water*
GA-4	225	375
GA-5	300	500
GA-6	375	625
GA-7	450	750



Without jacket but with complete No. 800 water equipment.

IDEAL ARCOLA GAS HEATERS open up a tremendous new field for heating by gas. With them you can heat small cottages, stores and shops and small buildings of every kind.

Here is a completely flexible system of radiator heating by gas, combining beauty of appearance with utmost efficiency in operation. Ideal Arcola Gas Heaters may be used for installations in buildings with or without basements and for operation with either steam or water equipment. Jackets, canopies and draft diverters are all of beautiful lustrous gray vitreous enamel.

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The new A. G. P. gas-fired steam radiator contains all of the positive and automatic operating features that have always been associated with it in the past, including gold-plated diaphragm regulator. It is furnished in three heights: 26″, 32″ and 38″, and in sizes from four to fifteen sections.

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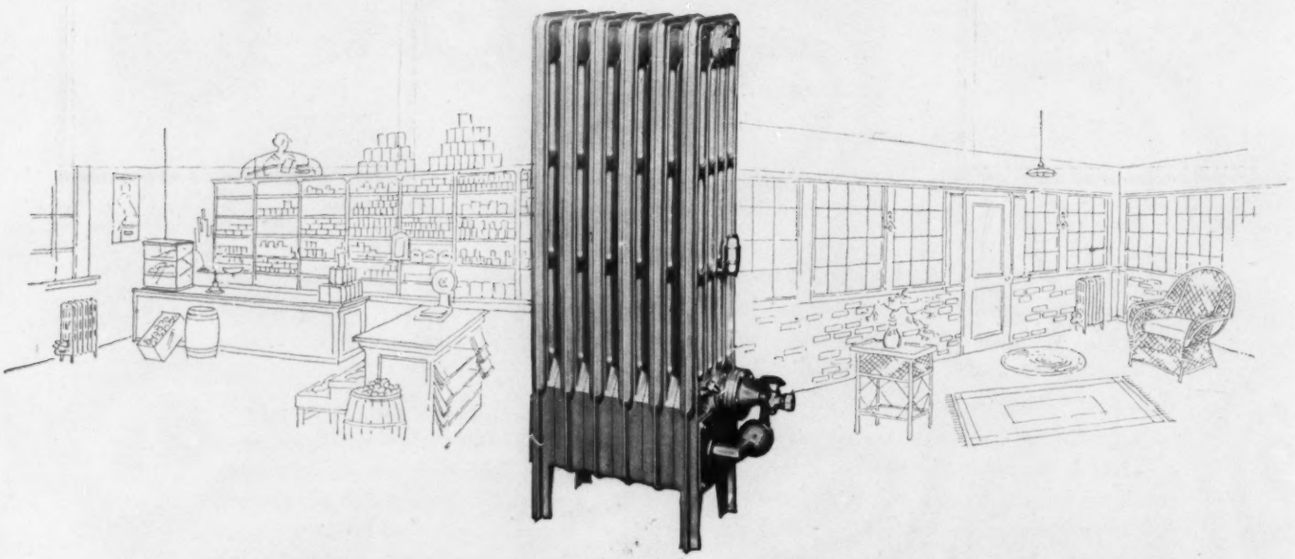

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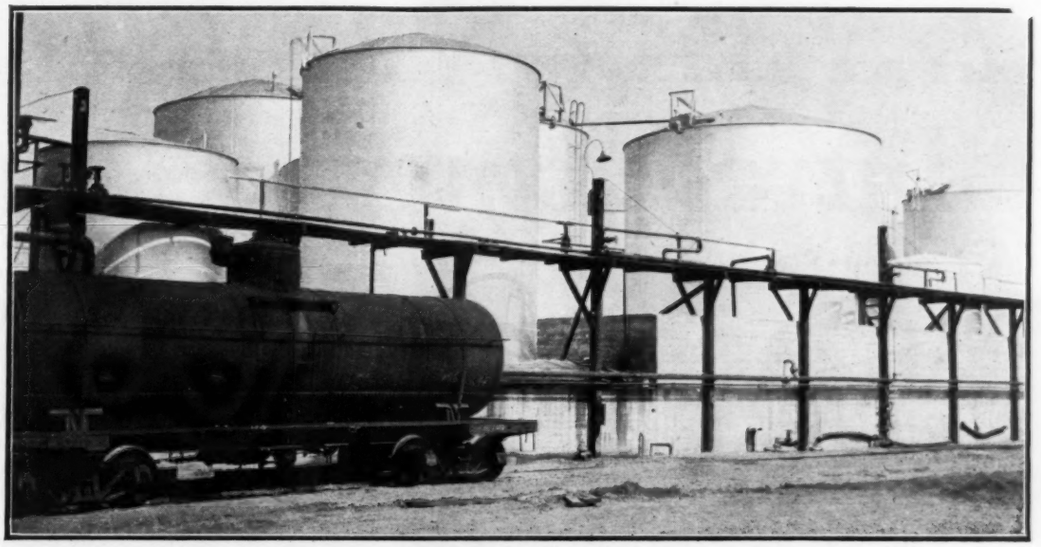

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HARMFUL ULTRA VIOLET RAYS *have slight effect* ON ALUMINUM PAINTS

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Bitulumin is largely immune to this attack because it offers to the sun's rays an aluminum armor which turns away 86% of them.

In turning back destructive light and heat rays Bitulumin makes a cooler surface and in the case of tanks reduces evaporation.

Bitulumin, while extremely popular for painting oil storage, is not limited to that field. It is a many purpose paint and has demonstrated its unusual qualities for painting tanks, tank cars, refinery equipment, metal buildings and roofs, smoke stacks, steel bridges and many others.

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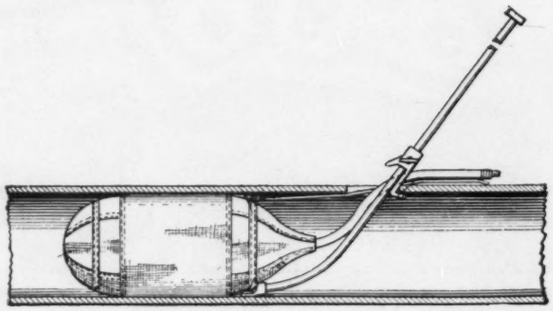

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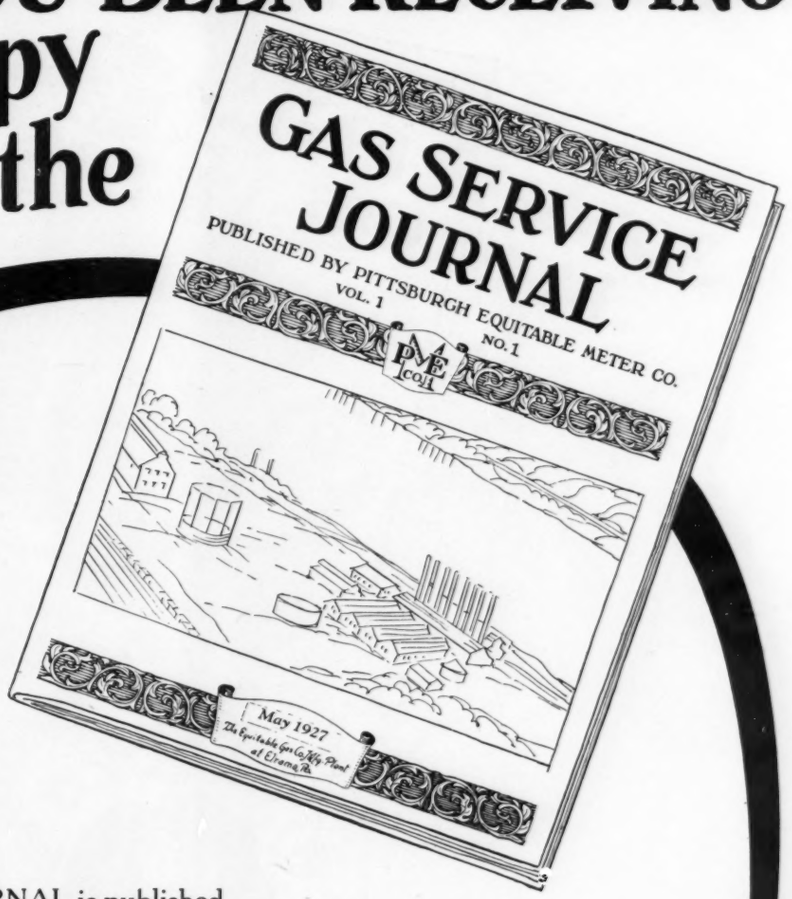

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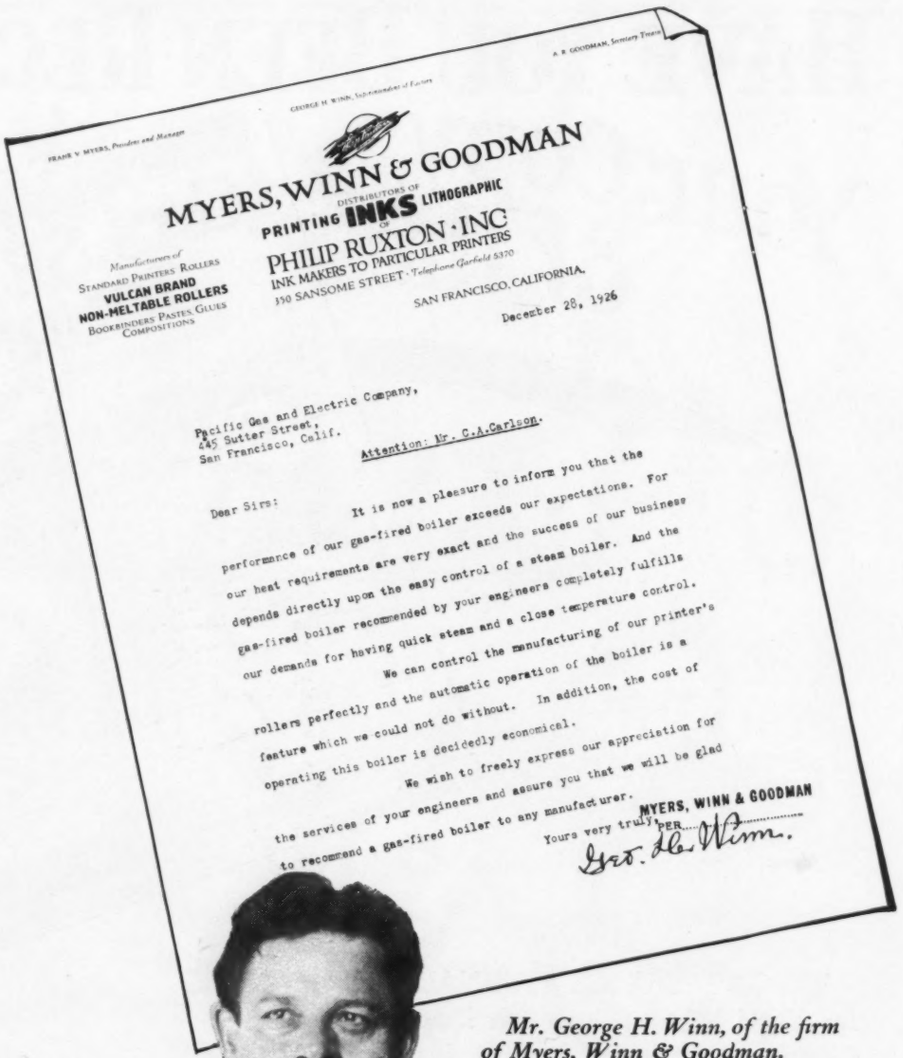

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PHILIP RUXTON · INC
INK MAKERS TO PARTICULAR PRINTERS
330 SANSOME STREET · Telephone Garfield 5370
SAN FRANCISCO, CALIFORNIA.

Manufacturers of
STANDARD PRINTERS' ROLLERS
VULCAN BRAND
NON-MELTABLE ROLLERS
BOOKBINDERS' PASTES, GLUES
COMPOSITIONS

December 28, 1926

Pacific Gas and Electric Company,
245 Sutter Street,
San Francisco, Calif.

Attention: Mr. C.A.Carlson.

Dear Sirs:

It is now a pleasure to inform you that the performance of our gas-fired boiler exceeds our expectations. For our heat requirements are very exact and the success of our business depends directly upon the easy control of a steam boiler. And the gas-fired boiler recommended by your engineers completely fulfills our demands for having quick steam and a close temperature control.

We can control the manufacturing of our printer's rollers perfectly and the automatic operation of the boiler is a feature which we could not do without. In addition, the cost of operating this boiler is decidedly economical.

We wish to freely express our appreciation for the services of your engineers and assure you that we will be glad to recommend a gas-fired boiler to any manufacturer.

Yours very truly,
MYERS, WINN & GOODMAN
PER Geo. H. Winn.

Our gas-fired boiler exceeds expectations

Mr. George H. Winn, of the firm of Myers, Winn & Goodman.

With all of Mr. Winn's twenty-five years' experience in making printers' rollers, he has never before been able to produce as fine and as durable printers' rollers as he is making today. His increasing business testifies to this fact.

That's the first statement in the above letter in reply to a question—Are you satisfied with your gas-fired boiler after using it for a year and a half?

And the letter reproduced here is from a company that knows a gas-fired boiler is easy to control, can be closely regulated and gets up steam quickly.

P G and E engineers will serve you

The same engineering service that helped the above manufacturer is also yours for the asking. Just phone or write to the nearest P G and E office. The engineers have information available on industrial heating operations which have been conducted successfully for many years. This service is at your command without cost or obligation on your part.

PACIFIC GAS AND ELECTRIC COMPANY
P·G·and E·
Owned · Operated · Managed
by Californians

IF IT'S DONE WITH HEAT, YOU CAN DO IT BETTER WITH GAS

THE LATEST ACHIEVEMENT OF OUR ENGINEERING DEPARTMENT

ALL WORKING PARTS ACCESSIBLE *and* INTERCHANGEABLE *while in Pipe Line—*

Reynolds Products
for all kinds of Pressure Reduction —for either artificial or natural gas.

Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

Valve—
- Automatic Quick-Closing Anti-Vacuum

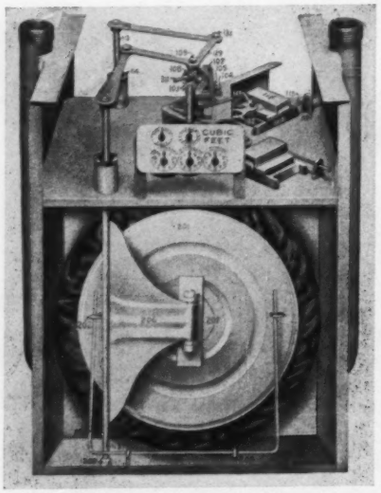
A TRIUMPH of our engineering assured by a background of thirty-five years of leadership and actual knowledge of the needs in the Gas Regulator field. Every working part in the MODEL 10 series may be removed while in the pipe line, and every working part is so accurately made that it is always interchangeable.

Reynolds Products are built to enable you to render your customers the greatest possible trouble-proof service. New efficiency in operation is offered in our new Model 10 Series. It will pay you to investigate the possibilities of making Reynolds equipment standard throughout your system.

Reynolds
Gas Regulator Company
Anderson, Indiana
Established 1892

New England Representative: EASTERN SERVICE CO., Boston, Mass.

PACIFIC METER WORKS · PIONEERS IN THE WEST ·



The Consumers' Meter

Construction

OUR standard dry meter has a rectangular case made of tin plate. Internally it is divided into three principal chambers separated by two partitions. One is set horizontally, and is known as the valve table, which forms the upper chamber; the other is set perpendicular to this and divides the lower part of the meter into two chambers. In each of the lower chambers there is a leather diaphragm, the motion of which is transferred by means of a vertical flag rod through a stuffing box to the upper chamber.

Both flag rods are connected by jointed arms to a revolving tangent mounted on eccentric or crank, which in turn actuates two slide valves by means of two valve arms. The valves are located in a separate enclosure, from which the crank projects through a stuffing box. A worm or spiral is mounted on the upper part of the crank, which operates a gear mounted on a horizontal axle, transferring the registration to the index.

Pacific Meter Works

of the
American Meter Company, Inc.
Northwestern Representative

SAN FRANCISCO
495 Eleventh St.

PORTLAND
Northwestern Gas and Electric Equipment Co.

LOS ANGELES
2118 Atlantic St.

AMERICAN METER COMPANY · MEASUREMENT ENGINEERS ·

Announcing

new and improved

TEEPLE

TEMPERATURE

TEEPLE *Controls*

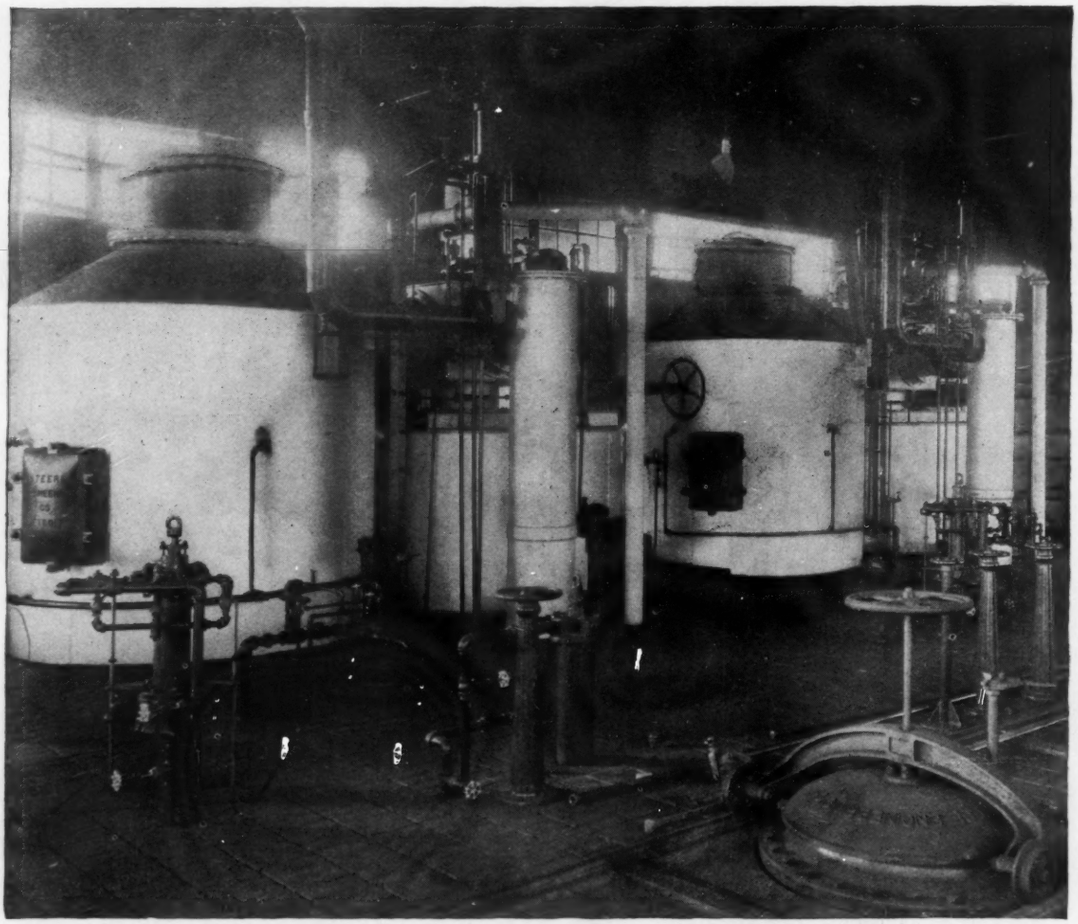
See our page advertisement in the September issue of this magazine

L. R. TEEPLE COMPANY

540 East Ninth Street **Portland, Oregon**

26 Months Ago The First Steere Water Gas Machine Went Into Service

The 27th is now under construction



Operating floor of the Steere Water Gas Plant at Marysville, California.

The First Steere Water Gas Machine with the **BACKRUN** produced results not previously expected by gas men. One set a month has been the average demand since we entered this field in 1925.

Seven repeat orders are the best evidence of good performance and mechanical perfection in every detail.

Operating flexibility is possible as in no other make or design.

Complete, detailed information and specifications for every size and capacity are contained in our Bulletin No. 42. We will be glad to send it.

SEMET-SOLVAY
ENGINEERING CORPORATION
Division Allied Chemical and Dye Corp.
40 RECTOR ST. NEW YORK

WESTERN GAS

A Monthly Journal of the Gas, Gas Appliance and Natural Gasoline Industries in *Western America*

Selling *the* Utility *to the* Users *of* Its Service

THIS discussion, which is as meaningful to the sales force as to the public relations department, was given before the Utilities Departmental section of the Pacific Coast Advertising Clubs Association, at the June meeting of that body in Portland. It earned a second prize for its author, and is richly deserving of attention from gas men everywhere.

Of particular interest are the paragraphs dealing with appliance selling by general company employees.—*Editor.*

By J. EARL JONES
Assistant Sales Manager
Portland Gas & Coke Company

INVOLVED in the sale of any commodity or service are the reputation of the seller and the confidence of the buyer. No longer is the purchase of any article of value based upon the apparent worth of the purchase, but rather upon the representations made by the salesman and the customer's belief that the statements made are true.

Every public utility has a worthwhile commodity to sell or the state would not permit that utility to operate. The public utility may sell transportation, communication, water, light, heat, or power, and through mass production and efficient management sell its service at a reasonable cost to the customer,—but unless the customer understands how to use that service, the organization that produces it and the service policy of the utility, the public will not voice its full approval.

In other words the customer must understand and believe in the public utility before he will appreciate fully the service that public utility renders. He will not buy an article of merchandise or appliance designed to use the utility service unless he believes the producer of that service will continue indefinitely to furnish the commodity at a reasonable price and give a quality of service equal or better than that which is being rendered at the time of his purchase.

Someone has said, "No article we buy is any better than the house that sells it." "Will the institution stand back of its service?" "Where will I be ten years from now, with my investment, if I buy the article?" "Can I always expect fair and just treatment at the hands of the institution who sold me the service?" These are logical questions asked by the average customer and must be satisfactorily answered by the public utility if it is to merit the confidence and support of the consumer.

THREE KINDS OF CONTACTS

How can a public utility best sell itself to the public? There are three general sales methods about which all customer contacts may be classified.

First: Advertising and Publicity. Second: Service Policy. Third: Employees. Little need be said about advertising media and the obvious necessity for a strong advertising and publicity department in a growing utility. Advertising is the one official spokesman in its written message from the utility to its customers and does more than any other one factor to define the relationship between the organization and the public. The public has a right to know what its servant, the utility, is doing and the conditions under which it operates. The public utility for its own sake to invite customer confidence and general prestige must consistently advertise its service. Open house and public demonstrations of service supplement the advertising and publicity.

Advertising moulds public opinion favorably or unfavorably towards the company. It inspires or destroys public confidence in the utility and may assist materially toward the growth of the institution. If that advertising is poorly designed and carries the wrong message it may seriously impair the growth of the utility.

The utility can silently advertise its growth and prosperity by keeping its property and equipment in an attractive and well preserved condition. Just as an individual is first judged by his appearance, so will the corporation be respected according to the general appearance of its production plant, distribution facilities, automotive equipment and office set-up. The public takes pride in the utility's outward appearance and showing as though the customers owned the business, which they do in reality.

Second: The service policy of the public utility contributes a great deal towards selling the company to the public. Generous, courteous and efficient service to the customer is a demonstration of the utility's good will to its customers, that no one can dispute. Once the company has sold itself to the customer in this way, no amount of false propaganda can ever disturb that customer's confidence. Good workmanship, quality materials, and satisfactory operation of the appliances furnishing the service will command the respect and ap-

proval of the customer although the utility may fall short of its duty in many other respects.

If the customer believes he can call on the company on a moment's notice and get friendly recognition and dependable service, that customer will pay a higher price if necessary for the commodity or service without complaint.

THE third and most important factor in selling the utility to the public is through its employees. When you stop to consider that the average public utility has several hundred employees widely scattered throughout the territory it serves, mingling with all classes of people and participating in social, community and civic matters, it is difficult to realize the tremendous value of these employees as a selling force for the company.

General utility employees may be active salesmen in every respect. Experience has proved that the rank and file of the employees can successfully sell its company's securities. No doubt the sale of public utility stock through employees has done more than any other factor to mould favorable public opinion to the company. "Where the pocketbook is interested, there is the heart also," is especially true in public utility customer ownership. With the thousands of customer owners in nearly every large public utility today, how many times do we hear our customers say, "I have a financial interest in that company and I know that the management and service are first class."

Not only have general employees demonstrated their ability to sell preferred stock to customers, but in many cases the regular employees are counted upon to sell appliances and take orders for the company's service. The experience of the Portland Gas & Coke Co. along this line may be of interest.

ABOUT two years ago the plan of selling gas appliances through regular employees was introduced. A constructive program of education and training for the general employees was laid out. Departmental and group meetings were held at which time the various appliances were demonstrated and model sales talks given to the employees. Employee bulletins outlining sales campaigns and presenting new appliances have been a matter of course. Short sales talks on the various major appliances have been published in the monthly house organ for the benefit of the general employees.

To make it worth while for the employees a modest but reasonable commission is paid on both direct sales made by the employees and on prospects turned in from which sales result.

The Portland Gas & Coke Company pays its regular employees outside of the Sales Department a 2 per cent bonus on prospects turned in, which result in sales, and 5 per cent commission on orders taken by the outside employees. These prospects are turned over to the special salesmen who follow them up closely and make a large percentage of sales. Incidentally the special salesman is not penalized in any way on his commissions for the regular employee prospect. To do this would discourage the salesman in giving the same atention to the general employee prospect as he would to work he has initiated himself.

As a result of this plan the Portland Gas & Coke Company has been able to sell from five to ten thousand dollars worth of appliances each month through its general employees. The employees make as high as $25.00 extra bonus on appliance sales without interfering in any way with their regular work. This plan has helped to improve the work of the employee in the office or on the customers' premises through the employee selling plan by enlisting the active support and interest of the employee in the company's business.

It should not be overlooked that the very nature of general employee selling necessitates first selling the employee himself on the company he serves. Feeling his responsibility in representing the company's service to outside customers, or in selling its stock or appliances, the employee will equip his own home throughout with the company's service. He will set aside a part of his earnings for the purchase of some company stock and will thus take a greater interest in the company's affairs and better inform himself regarding his company's interests, service, etc. As a result, this same employee who might otherwise have been a "time clock" wage earner has been developed into a high class representative who is a valuable asset and credit to the firm he works for.

If the rank and file of public utility employees sincerely believe in their own company they are sure to radiate this enthusiasm and confidence to the outside public. Thus, the consumer becomes inspired with the same zeal and interest as the employee with whom he comes in contact and thereby becomes a better satisfied customer.

It is true that before the regular salesman or the general employee can sell the prospective customer, he must first sell that customer upon his company. Unless the customer actually believes in the responsibility of the company and its ability to do what it represents, the customer will hesitate to buy its service. Not only will the customer delay in buying the service, but he will also seek an opportunity to complain on the slightest provocation. On the other hand if the service is reasonably satisfactory and the customer believes in the public utility, and its management, there will be fewer complaints, less criticism, and a more friendly public attitude.

Satisfied, loyal employees in the capacity of salesmen are a pre-requisite to any successful operating public utility. Anything that a company does to benefit the personal life and welfare of its employees will make them respond more loyally and whole-heartedly to any appeal that is made. Employees must be taught that they are the Company, that the average customer looks upon the employee he deals with as the Company and judges the whole organization and management by the conduct of the individual employee involved in the transaction. This sentiment places a feeling of responsibility on the employee that makes him a better representative of his company. He will more carefully guard his words and actions in public as well as become more conscientious in the quality of his work.

VARIOUS methods have been employed successfully by utilities to improve the ability, health, happiness and general welfare of employees. Educational courses, sanitary and wholesome working conditions, recreational facilities, group insurance, age retirement pensions, discounts on service, etc., all tend toward long term employment and more loyal employees.

(Continued on Page 71)

In September:

¶ Everyone knows what is due in September!

¶ From September 12th to 16th gas men are making Santa Cruz, Calif., their headquarters, as the Pacific Coast Gas Association holds sway for its thirty-fourth consecutive year.

¶ *Western Gas* will signalize this eventful occasion with a Convention Edition—a 200-page exposition of what the Convention has in store.

¶ Convention papers and committee reports will appear in advance in *Western Gas* for September.

Give *the* Meter *a* Chance

Miracles *of* Endurance *and* Accurate Measurement Are Often Expected *of* This Essential *though* Much-Abused Instrument

By K. C. TOMLINSON
Assistant Manager, Pacific Meter Works

THE gas meter plays a very important part in the operation of a gas utility. It measures the income of the company as far as its primary business objective is concerned and in that way acts as its cash register. It also acts as a medium between the company and the consumer, thereby playing an important part in public relations. Poor meter performance may seriously affect a utility's operation in that it may force the company to apply a rate not conducive to increased gas consumption or in causing the company to fail to receive adequate return upon the rate in force. To the individual consumer this poor meter performance leads to suspicion and lost confidence in both the meter and the gas company.

K. C. Tomlinson

These conditions are generally not the fault of the meter primarily but the meter reflects poor operating conditions in a manner most noticeable and least pleasant—namely, in one's pocket book, either that of company or consumer. Consequently the meter gets the blame and since it cannot speak for itself, it might be in order to enter a plea for us to "give the meter a chance."

OPERATING CONDITIONS VARY

The gas meter must be and is a very delicate measuring device. It must operate under conditions different in each company and locality, all of which have an important bearing on the life of the meter's accuracy. Temperature, pressure, kind of gas, heat value, sulphur content, condensible hydrocarbon vapor content, water vapor and oxygen content all have an effect upon its ability to function correctly. Because of the fact that these conditions vary in the case of each company and affect meter performance it is, therefore, a mistake to lay too much emphasis upon comparison of meter statistics between companies and between localities. An example of this is seen in the fact that most companies in the New England States operate coal gas and carburetted water gas plants and obtain a meter performance of from 80 to 90 per cent of the meters coming in from service after seven years, registering within the customary limits of accuracy. Gas companies upon the Pacific Coast, operating on oil gas, average from 50 to 60 per cent in this regard and comparisons cannot be made since oil gas, as ordinarily distributed, is far more destructive to meter apparatus than either of the two kinds mentioned above. An example upon the Pacific Coast can be illustrated by the fact that one of the large companies in the West is able to maintain meter accuracy within these limits for a period practically twice as long as other companies operating nearby with the same kind of gas due to efficient purification control in the plant and to extreme care in setting meters in sheltered locations to avoid extreme temperature changes.

The gas meter must at all times be able to deliver gas at whatever rate of consumption the consumer demands without fluctuations in pressure and with the meter operating at various temperatures, in many cases below freezing and at other times at temperatures as high as 100° to 110° F. It must operate at the slightest impulse and register the passage of gas at pressures lower than that of the human breath. Yet the meter performs this service silently and faithfully and keeps a record of the service as well. Because of the nature of its performance it must be of delicate construction and consequently is very susceptible to external conditions. This is not always given proper consideration and meters are often expected to function properly when buried in mud or sand or exposed to the glare of the hot sun.

Gas meter manufacturers endeavor to place the quality of their product upon as high a plane as is possible consistent with the price which the gas industry will pay for it. Considering the material used, the skillful labor required and the expenditure in research work that has been made, it will be seen that meter costs are very reasonable. Changes in detail of meter construction are constantly being made but it is of interest to note that the principle of operation, namely, that of the reciprocating engine, has been the same since 1844.

Manufacturers are also constantly endeavoring to safeguard the performance of the meter by improvements designed to more ably withstand the effect of impurities and foreign matter, present particularly in manufactured gas. The leather diaphragm as the vital part of the meter is generally most susceptible to deterioration and attention has been centered for many years upon the possibility of obtaining a substitute for leather, but as yet none has proven successful. Methods of tannage and nature of oil preparations for diaphragm leathers are constant subjects for research and every effort is made to use a high grade of leather impregnated with the oil which will give the maximum resistance to the leaching effect of benzol or other condensible hydrocarbons present in gas.

MUST PROTECT DIAPHRAGM

The necessity for keeping the diaphragm in first-class condition is of vital importance as the loss of the oil from the diaphragm due to the leaching effect of benzol and other condensible hydrocarbons leads to rapid deterioration of the leather. The loss of the oil allows water vapor to get into the leather which, in the presence of gaseous impurities such as hydrogen sulfide or hydrocyanic acid, develops an acid condition resulting in the formation of salts destructive to leather. The leather then stiffens and for a time the meter diaphragm may possibly be restricted in its movement causing the meter to run fast. Due to the condition of the leather, however, the meter will soon develop cracks or holes allowing the passage of gas from compartment to compartment. This results in a slow meter which may gradually lead to a D. R. condition. which means that it will not register at all.

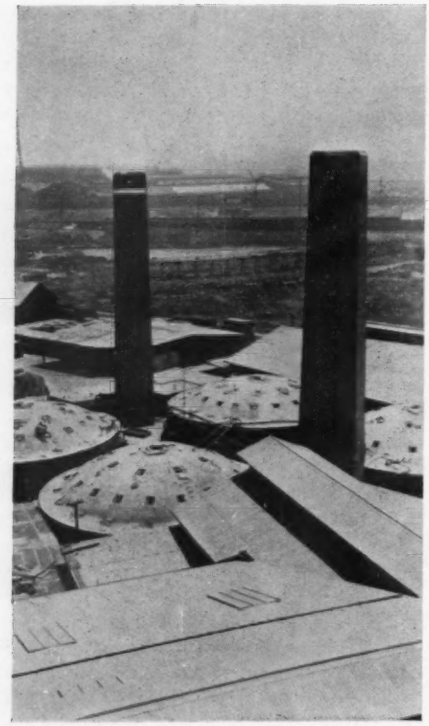
This condition may be developed particularly where the leather comes in contact with metallic parts causing the formation of iron salts which rapidly destroy the leather. Such a situation

(Continued on Page 68)

Gas Fuel *in the* Ceramic Industry: *Part III.*

Firing Face Brick

By LEE HOLTZ



Down-draft kilns at Los Angeles Pressed Brick Company's plant, where brick shown on these pages were manufactured

¶ In alternate issues *Western Gas* is presenting installments of Mr. Holtz' series. Our April number contained "Gas in Cement Making". In June there appeared "Firing Building Brick". Mr. Holtz is assistant superintendent of distribution for the Southern California Gas Company.

IMPROVEMENTS in the methods of manufacture have made it possible to produce brick that are exceedingly attractive in shape, texture, and color, as well as of very durable construction.

On every side our attention is attracted to the fronts of our large office buildings and palatial homes where smooth surface, sharp and round edge face-brick are used. In some cases they are glazed or enameled; in others a combination of two or three colors are artistically arranged.

To arrive at our present day state of development in brick manufacture, a great deal of time and money have been spent in research by the brick companies and allied industries. Progress today is going forward even more rapidly than ever before and prospects for more artistic designs to please the public and architects are only in the offing.

Cream, buff, old gold, and some red brick are made by the dry press process and, owing to the small amount of moisture needed for shaping and bonding, no drying is necessary before burning. After pressing they are usually placed in a round down-draft kiln approximately 32 feet in diameter and 12 feet high. A kiln of this dimension will hold 75,000 brick or 180 tons of material. There are usually 12 fire boxes placed equally around the periphery and projecting into the kiln some 16 inches from the inner wall. The fire boxes on the inside of the kiln are surrounded by a "bag" wall 4 to 5 feet high and open at the top, to allow the hot gases to flow up toward the top of the kiln down through the ware and through the perforated floor into the flue and thence to the stack which is generally placed so as to care for 3 or 4 kilns.

A damper is placed in the flue near the stack and is so arranged that adjustment can easily be made during the different stages of firing.

Other types of intermittent kilns are employed at times, namely, the top draught or up-draught and the horizontal draught. The up-draught kilns are less expensive to construct but on a whole are wasteful from a fuel-burning standpoint. The horizontal kiln has practically been eliminated. In consideration of intermittent kilns, the round down-draught is perhaps the most economic in fuel use and the hot gases are more evenly distributed.

CREAM AND BUFF BRICK

The firing of cream and buff brick is probably the most delicate operation of all brick-burning, owing to the composition of the materials of which they are made and the very exacting color required in the finished product. The color of bricks depends principally upon the presence of iron, lime or magnesia in the clay. A large proportion of oxide of iron gives a clear bright red. Magnesia produces a brown color and when in the presence of iron, a light drab color. Dry pressed brick are often colored artificially, either by mixing clays of different composition or by mixing mineral colors with finely ground clays. However, with all the care taken in fabrication, if not properly burned, the desired results will not be obtained.

The main requisite, of course, is first, the desired color. Next is a uniform burn throughout the kiln and to fully accomplish this end many things are to be considered. The writer has seen kilns set with material to produce cream brick and, upon being opened at the finish of the burn, there would be as many as three distinct kinds of ware. From the top of the kiln down for about one-third of the way would be "old gold" brick which is reddish brown in color mingled with black specks. The black specks are nothing more than the iron in the clay brought out by over-burning. The center of the kiln would be a little lighter in color, perhaps a buff color, and the bottom third of the kiln would produce the desired cream brick.

One can readily see the handicap to the manufacturer who has an order on hand for several hundred thousand cream brick and a kiln capable of producing 75,000 brick, yet only obtains 25,000 per firing. Besides, no orders may be on hand for buff or old gold, and yard space must be taken up for storing.

To assist the operator, or "burner," as he is called, in burning his ware, Segger pyrometric cones are placed at the top, center and bottom of the kiln. These are made of various clays that will fuse at certain temperatures. For cream or buff brick, the cones in the three sections mentioned must be brought down at about the same time to produce a uniform kiln. Otherwise, in an effort to bring down the bottom cone, the top may be considerably over-burned, because the hot gases pass from the top of the kiln downward. It is obvious, then, that fire control is the main consideration and many factors pertaining to combustion are to be taken into account.

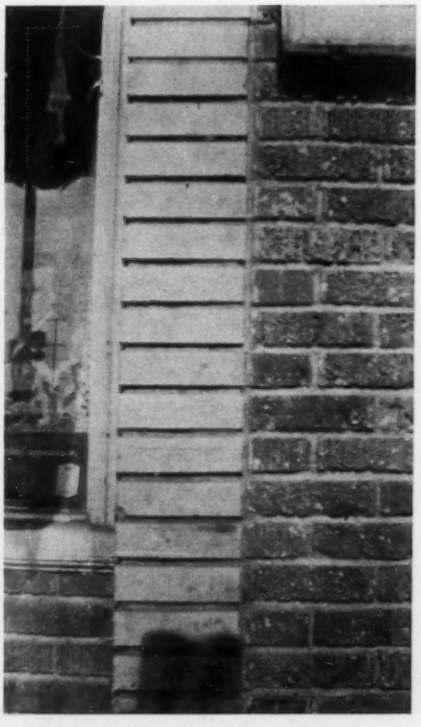
REQUISITES FOR EFFICIENCY

It is generally understood that for complete combustion of any fuel there must be an adequate supply of air intimately mixed with the combustible gases coming from the fire mouths, and, owing to the fact that gas and air currents can pass along in a stream side by

side and not mix, it can readily be seen that the burning equipment should, in the first place, be properly designed. There is the problem of adjustment which must consider the proper burner orifice size in relation to a suitable gas pressure at the burner, the number and size of burners to be used, kiln draft in relation to secondary air, and a properly designed fire box.

There are many cases where the first installation may have been adequate when the brick plant started in a small way, with perhaps one or two kilns, but, as expansion took place, more kilns were built and the house lines were extended (often with a reduced size), causing a considerable drop in pressure on the brick plant's distribution system, and rendering the burning equipment inefficient. A condition of this sort means that the gas company serving the fuel must maintain a higher pressure at the meter, and, in some cases, is called upon to raise the pressure on an entire district. This, of course, is costly operation for the gas company and is a severe handicap in distribution.

The atmospheric type of burner is perhaps more prevalent than any other type used in down-draft kiln operation, and if properly installed, is probably as economical and efficient as any burner. However, it is quite a common thing to find a single burner to the fire box, under-size and considerably overloaded so that the burner must be forced to deliver the necessary heat units to do the allotted amount of work. This results in poor combustion, increased cost, and often an inferior quality of ware.



Tan rug face brick, with light smooth face brick trimming

Tan rug face brick, made by Los Angeles Pressed Brick Company

The disadvantages of forcing the burner are that the air mixer is not in proportion to the orifice size and that the gas stream is of such volume that the necessary air cannot thoroughly mix. In case the pressure is lowered or the demand for more fuel makes it necessary to have a full opening on the burner valve the velocity is lessened, and the jetting effect in the air mixer to supply the necessary amount of primary air is lost. If excessive pressure is used to create velocity and at the same time to meet the fuel demand, a blasting effect is apt to be had, causing rapid disintegration of the fire box and "bag" wall as well as reducing the pressure within the kiln.

Ordinarily, two or three burners to the fire boxes, with smaller drillings and with a pressure of approximately 2 pounds at the burner, will give a more flexible arrangement. The gas streams will be smaller, each having its own air mixer to jet in the exact amount of primary air so that combustion will take place at the burner tip and in the fire box. The secondary air is drawn in by the stack which should be only sufficient to carry away the products of combustion and assist in maintaining a uniform distribution of the hot gases throughout the kiln rather than a condition of gaseous combustion which will very often cause discoloration of the ware, besides being extremely wasteful.

There are many advantages in the smaller gas streams, having just enough velocity to take in the right amount of primary air. The complete combustion of the fuel is more apt to take place in the fire box. The internal atmospheric condition of the kiln is free from impurities. The damper is handled more effectively for the distribution of heat in bringing down the cones at the desired temperature within a reasonable range of time and with the assurance of a uniform product.

The maximum temperature required to burn cream and buff brick is approximately 2100° F., from 115 to 120 hours time being necessary to complete the process. About 4,500 cu. ft. of 1100 B.t.u. gas is required to burn one ton of ware.

"Rug" and "Ruffle" brick, also used as face brick, is made by the stiff mud process; the shaping is done by a steel dye placed on the end of a pug mill from which the mud is thoroughly agitated and forced into the dye by revolving steel blades.

Because of the moisture content, these bricks require drying before burning. The more modern plants use waste heat dryers for this purpose.

There has been much discussion among clay manufacturers regarding the feasibility of direct, indirect and waste heat dryers. However, it is at present conceded that waste heat is most economical. This method is perhaps best effected by portable induction fans mounted on a small truck, with a large funnel or hood arrangement connected to the intake side which is placed at the wicket or door of the kiln after the completion of the burn. The hot gases are then drawn out by suction and transmitted by air ducts to the dryers, serving a two-fold purpose: first, removing the heat from the kiln in order that it may be unloaded quickly and again placed in operation; and second, making the heat already used for one operation again useful. At such times when waste heat from the kilns is not available, auxiliary gas-fired furnaces directly connected to the dryers are used. The temperature of the dryers is maintained by thermostatic control, ordinarily running about 250°F. From 36 to 48 hours time

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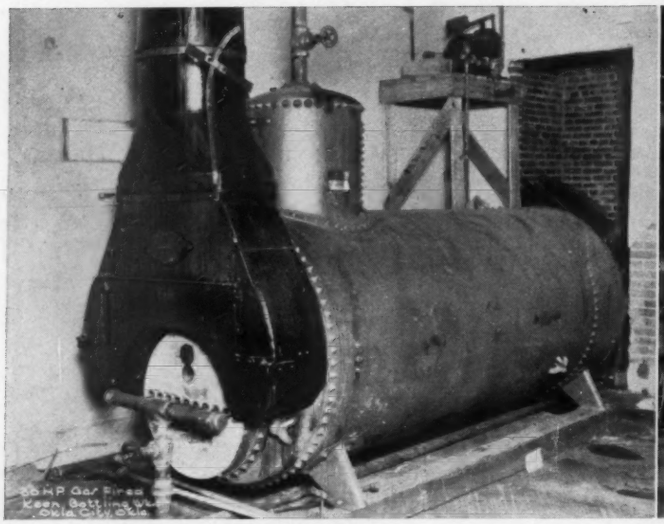
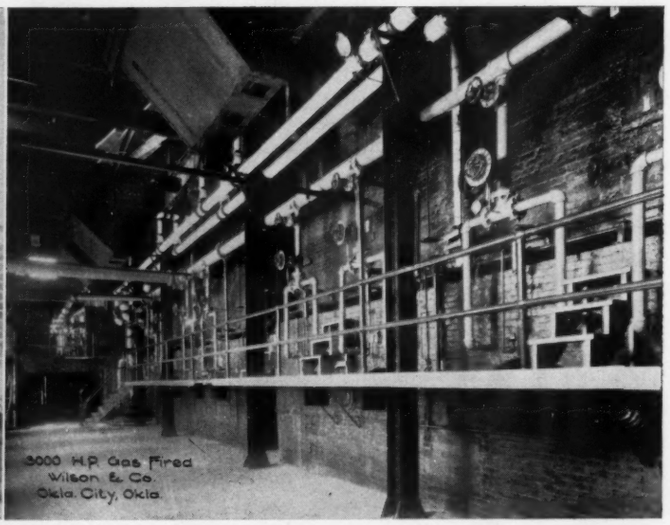




A study in contrasts. On the left is a 30 H. P. marine boiler; on the right a battery of boilers, rated at 3000 H. P.—both gas consumers on the lines of the Oklahoma Gas & Electric Company, Oklahoma City

Large *and* Small Industrial Users Get Equal Consideration *in* Oklahoma City

By LOGAN W. CARY
Superintendent Gas Department
Oklahoma Gas and Electric Company

A LETTER which reached the editors of *Western Gas* during July was of such interest from a gas utilization point of view that we are herewith sharing it with our readers, under the name of its author, Logan W. Cary, superintendent of the gas department of the Oklahoma Gas and Electric Company. Oklahoma City, served by this utility, does not offer as fruitful a field to the industrial gas man as some other sections of the country—yet the gas company in this city has developed a considerable boiler load, and goes more than half way with its industrial consumers to see that they get satisfaction.

ONE of the enclosed pictures (above) shows a small marine boiler that has been converted to gas and has a rated capacity of 30 H.P. The other picture shows a large battery of boilers containing 3000 H.P. that is fired with gas. You will note the second picture shows a boiler plant one hundred times the size of the first picture, but just as much care is used in maintaining high efficiency in the small plant as is taken to maintain high efficiency in the large plant. Due to the few manufacturers in this district, most of our industrial gas load is made up of boiler fuel. Our boiler load amounts to about 14,000 boiler H.P. These boilers will use about two and one-half billion cubic feet of gas per year.

The first step taken in securing this business is to find out the kind and amount of fuel that is used and the efficiency of the plant in using fuel other than gas. We are then able to tell the prospective customer very nearly what it will cost him to operate his plant on gas and in most instances we are able to create a very much higher efficiency with gas than is being obtained with coal or oil, although we realize in the larger plants it is actually possible to obtain an equally high or in fact a little higher efficiency with oil than it is with gas. However, our experience has taught us that by careful co-operation of this company with the consumer, we can increase the efficiency of his plant. After the business is obtained, these plants are constantly visited by a combustion engineer and this company sees that the highest efficiency is maintained. In some instances we even go to the expense of making careful weighed water tests in order to find out just what is being done in the way of efficiency. This combustion engineer keeps well acquainted with the boiler-room personnel of all plants on our lines and the employees of our customers feel at liberty to call on us for an extra check at any time. This has a very good effect in two ways. First—it enables us to hold the business and second—it keeps our customers so well sold on the idea of using gas for a boiler fuel that when there is a small or large increase in their gas bill they immediately know that either there is something wrong at the plant or their boilers have been called on for more work than usual during this particular month.

We endeavor to get all plants equipped with draft gauge, CO_2 recorder, rigid damper control, thermometer suitable to take stack temperatures and any other instrument that might be needed in a particular plant. In the small plants we recommend the use of a fuel control governor but do not recommend the use of a governor when a fireman is constantly on the job, as the draft of a boiler should be changed with the amount of fuel being consumed.

I wish to impress upon you that just as much care is given to maintaining maximum efficiency on the small marine boiler, shown in the enclosed picture, as there is on the 3000 H.P. setting, although it is not possible to obtain as high efficiency on the small plants as it is on the larger ones.

We have found that we have been able to greatly assist the men in charge of the local boiler rooms in securing

(Continued on Page 70)

Master Meters Bring Gain *in* Denver Apartment Gas Use *and* Revenue

By ROY G. MUNROE
Gas New Business Manager
Public Service Company of Colorado

THE gas sales representatives of the Public Service Company of Colorado are compensated on a schedule which takes into consideration the increased gross revenue produced on each representative's territory. Apartment house consumers have always constituted a class whose usage of gas and electricity has been extremely difficult to influence.

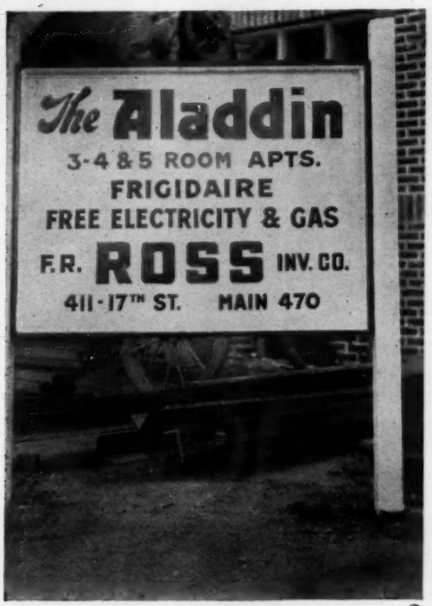
Some months ago Ottomar O'Donnell, architects' and builders' service engineer of the Gas New Business Department, undertook to solve this problem through the promoting of the master-meter idea among the architects and the apartment house owners of Denver. That this plan will materially increase both consumption and revenue per apartment is indicated by the statistics gathered thus far by Mr. O'Donnell.

DRIFT AWAY FROM GAS USE

Apartment house tenants not only use gas and electricity less liberally than do their neighbors in detached dwellings, but their tendency is that of most other Americans—towards less and less family cooking, home baking, home laundry work, and home living. The restaurant and delicatessen store, the door-to-door bread man and the progressive laundry proprietor are all taking business away from the public utilities almost as fast as we can create additional load by aggressive new business promotion.

Many American cities are at this time somewhat "overbuilt." Wherever this condition prevails, apartment house proprietors are contending with numerous vacancies, and the time is ripe to introduce the master-meter idea. The proprietor who has vacant apartments on his hands soon begins to plan some painful rent reductions. He will welcome any helpful suggestions. A few statistics from our consumers' ledgers are usually sufficient to convince him that the average apartment house tenant uses such small quantities of gas and electricity per month that "free gas and electricity" will cost the proprietor but a small sum per month per apartment.

On the other hand, the psychological reactions of prospective tenants are such that they place a value upon "free gas and electricity" out of proportion to the actual cost of such service. For instance, in one large Denver apartment house the proprietor was planning an initial rent reduction of $5 per month in a vain endeavor to fill 15 vacancies. His tenants were paying individual gas and electric bills, averaging a total of about $2 per month per apartment. He was induced to advertise "free gas and electricity," installed a master meter and filled his vacancies quicker than he could have hoped to fill them with a $10 per month rent reduction.



Denver apartment owners acquire tenants by advertising "free gas and electricity"

This free service is costing him only $3 per month per apartment, in spite of the fact that his tenants have taken advantage of his liberality to more than double their former average consumption of gas and electricity. This is because he now purchases both gas and electricity through master meters and pays for the service upon the Doherty three-part rate known as the wholesale schedule.

One of the difficulties to be overcome in presenting the master-meter idea is that of correcting in the mind of the proprietor the same exaggerated idea of the cost of free gas and electric service which, when existing in the minds of the tenants, can be made to work so effectively in the landlord's favor. His first reaction is identical with that of the tenants—that such free service will be so wastefully used as to make the cost excessive.

We have found it necessary to show such proprietors not only statistics on their own buildings, but also those from other similar apartment buildings in the city. Once the apartment man can be made to realize what huge and wholly improbable increases in consumption per apartment can be included in an over-all cost entirely satisfactory to him per apartment, he himself begins to plan ways and means to capitalize on the new idea.

50-100 PER CENT INCREASE

Statistics collected during the past year's experience indicate that apartment house tenants will increase their former normal use of gas and electricity from 50 per cent to 100 per cent when changed over to "free service." Unfortunately a tendency to revert to lower consumptions as the novelty wears off is already apparent. However, even under the master meter or three-part rate a substantial increase in gas and electric revenue per apartment house meter is shown. The reduction in the rate per unit is more than offset by the increased consumption per apartment.

Another instance of increased revenue per tenant is that of the Pencol Apartments where the results were as follows:

	41 each Gas & Elec. meters	*1 Gas & Elect. meter*	*Incr. Gas & Elec. Cons. & Rev.*
Domestic Gas Cons. per Apt.	800 cu. ft.	1560 cu. ft.	760 cu. ft.
Water Htg. Gas Cons. per Apt.	00 " "	4300 " "	4300 " "
Domestic Gas Rev. per Apt.	$.76	$1.43	$ .67
Water Htg. Gas Rev. per Apt.	.00	$1.32	$1.32
Electric Cons. per Apt.	26 kw.hr.	45 kw.hr.	19 kw.hr.
Electric Rev. per Apt.	$2.08	$2.08	$ .00

The outstanding conclusion to be drawn from the domestic gas figure in the Pencol Apartments is that the average tenant has consistently used twice as much free gas as experience shows the average tenant uses when paying for it himself. The ratio of two-to-one is great enough to be of considerable importance. There must be an underlying cause. We must continue to assume that no appreciable amount is wasted and if we do, we are forced to realize

The Gross Apartments, Denver, Colo., a user of gas through a master meter

that use is made of this much gas. Why are other apartment tenants so niggardly in their gas purchases? It may be either of the following two reasons, or a combination of them. Does fear of a "high" expenditure beget parsimony? Is ignorance of the benefits and comforts supplied by gas so great that proper use of it is made only when it is furnished without cost? The answer should be worth a great deal to the gas industry.

WATER HEATING FIELD DISCLOSED

In addition to the information which this building has supplied in connection with strictly domestic gas consumption, it, and the master meter, have opened up a field of water heating which promises to have great possibilities. Large space heating cannot, as yet, be met by most gas companies. Small space heating in individual residences can be accomplished with profit, however. If the water heating facilities of a building are properly designed, we can heat water for large buildings during the summer with the plant capacity which supplies small space heating loads in the winter, letting the coal-fired boiler of the large building also produce hot water in the winter time. There is a perfect interlocking relation between the two loads.

Beginning in July, 1925, the entire water heating load of the building was undertaken. In addition to supplying hot water to 41 apartments, the plant also supplies water to all stores on the Colfax Avenue side. One of these is a drug store, with large fountain facilities and another is a restaurant serving about a hundred meals a day.

During the summer months the water is heated by gas. Whenever the weather is such that the fire is necessary in the space heating boiler, gas is supplemented by what is known as an Excelso heater which effects a transfer of heat from coal boiler to water in the reservoir. In this particular case the heater is considerably undersized and accomplishes very little.

It is well to call attention to the manner in which gas can be bought for water heating in this building, if the three-part rate is in force. It must be supposed that the owner is willing to furnish heat for cooking. The demand charge and the more expensive gas of the sliding scale is a necessity to meet this requirement which the owner wishes filled, and we have left for water heating a lower commodity price and no demand charge, it being assumed, of course, that the water heating demand is less than the working cooking demand.

Consideration of these two demands makes it of extreme importance to know whether the relation of the heater size and reservoir size is proper for the job. In some cases the reservoir is too small, and an extra large heater would have to be used, which would result in having to purchase extra demand for the water heater.

CONTINUOUS USE OF GAS

The daily hot-water load at the Pencol building is very close to 2500 gallons. We maintain an outlet temperature of about 160 degrees. The reservoir has a capacity of 960 gallons and we are able to work the heater by controlling the height of burner flame, at such a speed that it is in continuous operation close to twenty hours.

The ideal situation is very simply described. Let the owner purchase a certain size stream of gas; when the tenants want it for cooking, the whole stream, or any part of it, is available for that use. Their requirements are paramount. When not needed for small uses by some one of the many individuals who compose the community which we are serving, the stream of gas must be put to work heating water, which can be economically stored.

The gas utilization department of the Public Service Company of Colorado is now working on a demand distributor which will accomplish this result. It is our sincere hope that satisfactory operation will be reported in the very near future, and when perfection is obtained we will have some gas in use in the Pencol Apartment twenty-four hours a day. During peak cooking hours, around six in the evening on week days and around noon on Sundays and holidays, the gas used will be for cooking purposes; the rest of the time, with perhaps a slight safety factor for emergencies, gas will be burning constantly in the water heater.

Demand in the Pencol for water heating is in the neighborhood of 350 cu. ft. per hour, or roughly, a third of the demand necessary for cooking purposes.

In another part of the city there is a newly constructed 48 apartment building furnishing gas to its tenants at about 60 cents per apartment per month. It is fair to make the supposition that, if gas were not gratis to the tenants in this building, they would probably use no gas at all.

Ground has just been broken for a 72-apartment building in which gas and electricity will be furnished by the owners. The owners in this case are saving several thousand dollars in space for meters and in a simplpified pipe layout. Due to the fact that the wholesale rate is based on sale of gas through a demand limiting meter, the diversity factor in this large building will be greater than in any example which we could point out at present, and the average cost per 1000 cu. ft. will be less, which of course means that the cost to the owners per apartment will be smaller than any of the examples we have given.

In addition to the increased revenues secured by the company, the following benefits are noted when the master meter idea is adopted:

MASTER METER REDUCES EXPENSES

Investment, maintenance, depreciation, meter changing, meter reading, and meter billing costs are saved on the additional meters.

Expenses incidental to the opening and closing of accounts with many incoming and outgoing individual consumers are saved, such as credit rating investigations, turn-off and turn-on orders, final bill rendering, collection ex-

(Continued on Page 62)

14-200
S. L. THRIFT
1449 N. SAN JOSE ST.
CITY

WESTERN STATES GAS & ELECTRIC CO.
GAS DEPARTMENT
REPORT OF CONNECTED LOAD
AND ADJUSTMENTS OF APPLIANCES

	NO.	STYLE	SIZE	ADJUSTMENT
RANGE	1	Clark Jewel	48	Yes
HOT PLATE	1	No Name	3B	O.K
WATER HEATER	1	Pittsburg	#4	"
GAS FURNACES				
GAS HEATERS				
MISCL. APPL.				
MISCL. APPL.				

REMARKS 1¼" Service 1" fuel line
20 lt. meter
DATE 3/14/25 BY R Mackie INSPECTOR
over

Inspection card used in Stockton appliance servicing. On the reverse side was the happy notation: Good pressure—no leaks—no complaint."

Servicing Appliances Is Good-Will Agency

By J. E. KELLEY

General Superintendent, Gas Department
Western States Gas and Electric Company
Stockton, California

DUE to a large number of complaints of poor gas and poor pressure which our complaint man found to be caused by poor adjustment, dirty burners and other miscellaneous troubles on gas-burning appliances, we decided to make a house-to-house canvass to inspect and adjust all appliances on our mains in Stockton. It was our opinion that this service would be a benefit to the consumer and would help to make for good public relations.

INFORMATION SECURED

Cards were printed and run through the addressograph machine giving us the name and address of every consumer in the city. These cards were 3 by 5 inches and were large enough so that the inspector could note the following on the card: Size of meter, service and fuel lines, sizes and kinds of appliances used by the consumer and the nature of the work done on the appliances.

Two experienced and "presentable" appearing men were selected and equipped with a neat tool kit and badge. They were instructed to test the fuel line between the meter and the appliances for leaks, to clean and adjust the burners, replace broken parts, make sure that the piping was large enough and to tell the consumer of the danger in operating a water heater without a vent pipe. The men were also instructed to be neat in their work and above all to be courteous.

MINOR TROUBLES CUT DOWN GAS USE

The inspectors found a great many burners not being used on account of minor troubles such as dirty burners, air shutters stuck on the mixers so that the burner could not be adjusted, and burners out of line due to the valves being out of line on the manifold. When broken parts were found we ordered new parts and installed them at cost. The inspectors kept a supply of stove bolts on hand, as they found a great many bolts missing from the appliances. In many cases they found that the riser pipe between the fuel line and the appliance was too small to give the appliance the proper flow of gas. Some ranges were connected with ⅛-inch and ¼-inch pipe which was too small to supply them. The consumer was advised as to the proper size pipe to install and in all the places where this advice was followed we had no further complains about the gas. A great many water heaters were found without vent pipes and in the majority of places where these heaters were found the consumer had the vent pipes installed after the inspectors explained the danger of operating them without vent pipes.

J. E. Kelley

OBTAIN SALES LEADS

The inspector took time to put the appliance in order and also demonstrate to the consumer how to handle the appliance to get the best efficiency. Where appliances were found to be old and in bad condition the consumer was advised to purchase a new appliance. We did not sell gas appliances at this time, but our men obtained many live prospects for various installations which were turned over to the dealers.

In some of the places the inspectors found over-loaded meters and also small services which were replaced as soon as they were reported. In the majority of places where the meter was overloaded it was found that gas heaters were installed and the company was not notified by the plumbers.

Following is a summary of the inspection work:

Total visits	13,135
Total not at home	2,591
Total at home	10,544
Total using no gas	1,173
Total using gas	9,371
Total ranges inspected	7,844
Total hot plates inspected	1,820
Total water heaters inspected	5,893
Total gas furnaces inspected	113
Total gas heaters inspected	793
Total miscellaneous appliances inspected	558
Total automatic water heaters inspected	434
Total small industrial burners inspected	372
Total industrial appliances inspected	186

When the cards were run through the addressograph they included both gas and electric consumers. In the above table are shown a large number using no gas, but investigation revealed that the majority of them were service stations and offices in steam heated buildings using electricity only.

This service was a great help to us and the consumer. It enabled us to make friendly contact with the public, to obtain connected load data, reduced complaints and put burners back in use that were discarded for minor troubles. It enabled the consumer to get better efficiency from appliances which were out of adjustment, and where leaks were found in the piping it reduced his bills.

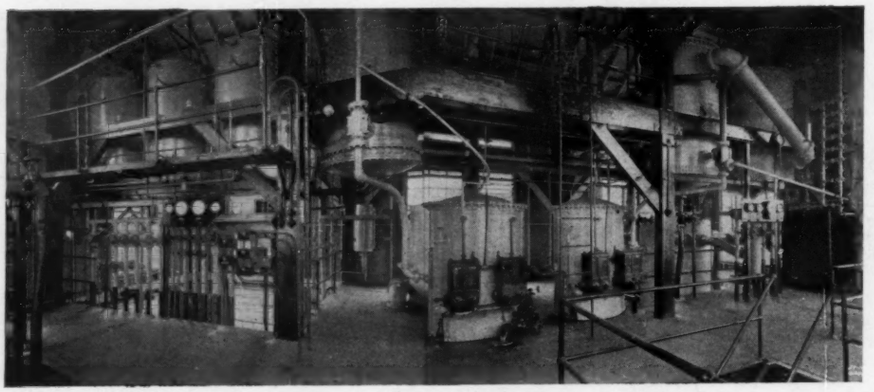
INSPECTION APPRECIATED

The inspectors made daily reports on conditions as they found them and also reported comments the consumer would make. Ninety-five per cent of the consumers were very grateful for this service and we received a number of letters thanking us for the service and mentioning the courteous treatment rendered by our inspectors.

Benzol Manufacture at Portland, Oregon

By N. H. WARDALE
Assistant Superintendent of Production, Portland Gas & Coke Company

THE overnight increase in the price of oil from 75 cents a barrel to $2.75 a barrel at the beginning of the year 1921 was a very serious situation for the Portland Gas & Coke Company, necessitating, as it did, a very substantial rise in rates for gas and creating serious doubts as to the future for making gas from oil.



Light oil purification plant, operating floor, Portland Gas & Coke Company.

The briquetting industry, which had been built up from a by-product previously of little or no value, caused longing eyes to be cast about as to the possibility of producing other by-products which would serve to still further offset the high priced oil situation and permit the company to preserve its large investment in oil-gas apparatus and plant.

It fortunately happened about this time that along with the high priced oil situation and partly due to the same cause, namely, a shortage of crude oil, there occurred a shortage of gasoline leading almost to a rationing of consumers. It was at this time that our general superintendent, E. L. Hall, conceived the idea of producing a by-product from the gas as a substitute for gasoline.

It had been, of course, known that oil gas, as well as gas made from other raw materials, contains appreciable quantities of benzol vapor. This substance had been in use for many years in other parts of the world as a very high grade motor fuel. In the case of oil gas, however, the quantities it contained were thought to be hardly large enough to justify a by-product recovery plant.

Mr. Hall theoretically worked out several new processes for making oil gas containing very much larger quantities of benzol and tar without changing the heating value of the gas so produced from a 570 B.t.u. per cubic foot standard.

Permission was secured to demonstrate the correctness of these theoretical calculations by a practical demonstration. In order to prove the theory by which it was thought possible to produce more than twice as much benzol per thousand cubic feet of gas as has been found possible at other gas plants, a thorough test under actual manufacturing conditions was made at the company's small gas plant at the Vancouver Wash., works. In October, 1920 S. H. Sundby and K. C. Tomlinson, general foreman and works chemist, supervised the operation of this plant for proving out the feasibility of the process.

PRINCIPLES OF BENZOL RECOVERY

Before going into the methods used in benzol recovery and refining, it might be interesting to discuss the principles involved. The products which are absorbed from the gas, the chief of which is benzol, are principally hydrocarbons or compounds consisting of atoms of carbon and hydrogen chemically united in different proportions; for example, benzol has a formula C_6H_6 and napthalene $C_{10}H_8$. All of these hydrocarbons are in the vapor form in the gas and are produced in the gas generator from the "cracking" of the fuel oil. They are not present as such in the fuel oil, but the atoms of carbon and hydrogen in the oil are rearranged by the action of the heat in the generator and form the benzol and other products.

Nearly all petroleum oils have the ability to absorb benzol in much the same manner as a sponge absorbs water. The most suitable and readily obtainable oil is a distillate similar to a light lubricating oil known as "straw oil," which is distilled from crude petroleum at California refineries and is shipped to Portland in tank cars.

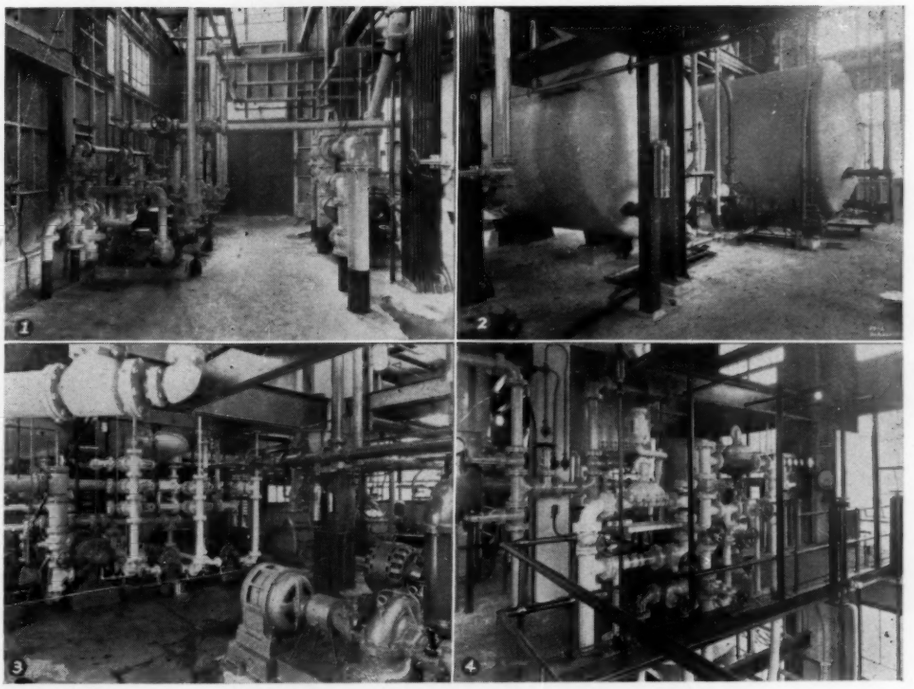
To absorb benzol or "light oil", as the mixture of compounds in the gas is called, it is necessary to bring the gas into intimate and prolonged contact with the absorbing oil or "wash oil." Merely bubbling the gas through it would be insufficient. The most usual method is to pass the gas through vertical steel tanks or scrubbers filled with wooden grids or similar material having a large surface area. The oil is sprayed into the top of the scrubber and is evenly distributed over the surfaces of the grids. This brings all the particles of gas into contact with the oil.

To recover the "light oil" absorbed in the "wash oil" the latter is heated under a vacuum and steam is blown through it, which converts the "light oil" into vapor again. The vapors are liquefied in water-cooled condensers and pumped to the refinery to be purified by washing with sulphuric acid and by distillation.

The wash oil after having the light oil distilled from it is cooled and used again in the scrubbers for absorbing more light oil.

To perform the above process experimentally without excessive cost for apparatus called for the exercise of considerable ingenuity.

To recover the light oil from the



ILLUSTRATIONS AT RIGHT:
1. View of first floor of Portland Gas & Coke Company's light oil purification plant, showing still charging and loading pumps. 2. Still kettles, same location. 3. Oil circulating pumps, water and vacuum pumps, first floor of oil washing plant. 4. Operating floor, oil washing plant.

wash oil used to absorb it from the gas a small still consisting of a horizontal tank 30 inches in diameter, eight feet long and holding less than 300 gallons was constructed. On top of this was set a pipe about ten feet high filled with steel turnings to serve as a rectifying column. Alongside of our present stills, one of which has a kettle holding 15,000 gallons, this outfit was an infant. Much of the material used for the test plant was obtained by ransacking the company's work yards.

During the distillation of a batch of oil the "safety valve," consisting of a two-inch cork in the top of the still, "opened" due to plugging of the condenser with naphthalene. The result was a shower bath for the operator. Any one familiar with the odor of unrefined light oil will realize that an encounter with a skunk could not have been more serious.

In order that the chemists of the company might have sufficient material to carry on the necessary investigations, a second set of tests were conducted by the writer in co-operation with Mr. Sundby. For these tests the scrubber on one of the gas generators was equipped with wooden hurdles, sprays and an oil circulating pump. A special continuous "stripping" still for removing the light oil from the wash oil with condenser, pumps and tanks was installed. Gas was made under various conditions and the tar and light oil recovered, and accurate determination made of both the quality and quantity so that ideal conditions could be established.

MARKET SURVEY MADE

Before much thought could be given to construction of a plant the disposal of the large quantities of benzol had to be considered. The principal uses of benzol are for motor fuel, as a rubber solvent, as an ingredient in paint manufacture and for the dry-cleaning of clothes. A very comprehensive survey was, therefore, made of the Pacific Coast in order to ascertain the potential demand for benzol and the possibilities of developing new uses. The determining consideration was, or course, the fact that benzol could rapidly be sold as a motor fuel, even though no other disposition could be found for it.

Complete tests were also made on the refining of the crude benzol. The acid washing was conducted in wooden barrels with the aid of a wooden paddle as an agitator, with the resulting disastrous effect to clothes and overalls of the writer and Mr. Tomlinson which such makeshift methods of handling acid involved. The transfer of the benzol to the different barrels and into the small refining still was done by means of a hand pump.

MOTOR TESTS CONDUCTED

Sufficient benzol, both crude and refined, was produced not only to furnish the large amount required by our prospective customers for test, but also to enable trials to be made on the use of the benzol as motor fuel by some of our own trucks and automobiles and to complete a series of tests on a specially equipped automobile engine by Professor S. H. Graf of Oregon Agricultural College. In these tests horsepower developed, carbon formation, oil dilution and other characteristics were studied.

Complete cost estimates covering the construction and operation of both a recovery plant for the crude benzol and a refining plant were than made and the proposition appeared so attractive that an appropriation was requested to build the two plants. At this time many of the benzol plants constructed as a war emergency by the United States Government in connection with city gas plants were being dismantled all over the country because the revenue was not sufficient to provide operating costs. The construction of a new benzol plant at such a time appeared so unwarranted that experts from New York came to Portland to go over all our test records and estimates to make sure that no errors had been made.

GAS PURIFICATION EFFECTED

It would be well to state that financial benefits were not the only or even the principal reason for adopting the recovery of benzol. The fuel oil from which our gas is made had a sulphur content which had been increasing for several years and this increased the "organic sulphur," an impurity in our gas, which was not removed by the oxide purifier boxes. Napthalene was also causing considerable expense and trouble in obstructing our mains and services. The recovery of benzol is accompanied also by the removal of these substances, as well as those which form the gummy deposits on our meter valves and cause them to stick and register "slow." From the customer's viewpoint the installation of the oil washing process was a distinct advantage as a material increase in the purity of our gas resulted, which decreased the tendency for deposits to form on range burners, cooking utensils and water heater coils.

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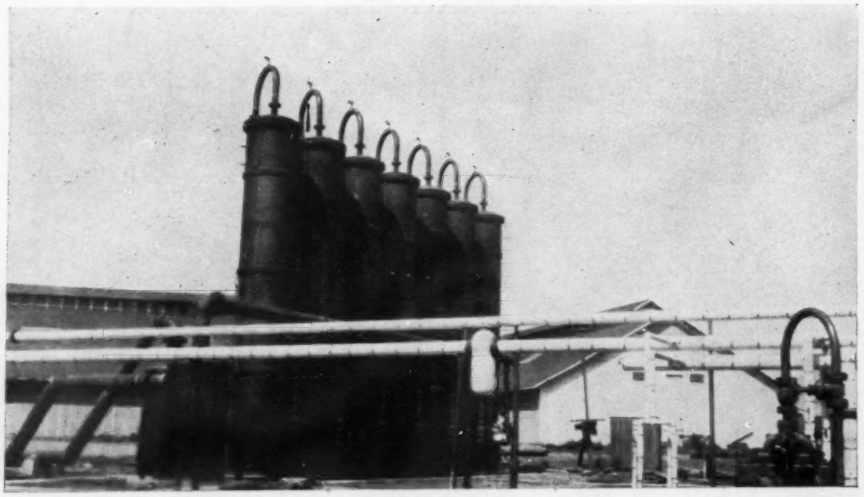


LEFT: Absorber equipment of the Cienaga Corporation's new stripper plant now working on the lines of the Ventura Fuel Company, showing battery of seven Campbell "Oil Froth" absorbers, with main and auxiliary steam headers in the foreground. An aluminum paint covering has beeen applied since the view was taken

World's Largest Stripper Plant Now Operates *at* Saticoy, Cal.

By EUGENE TAYS
General Superintendent
Cienaga Corporation

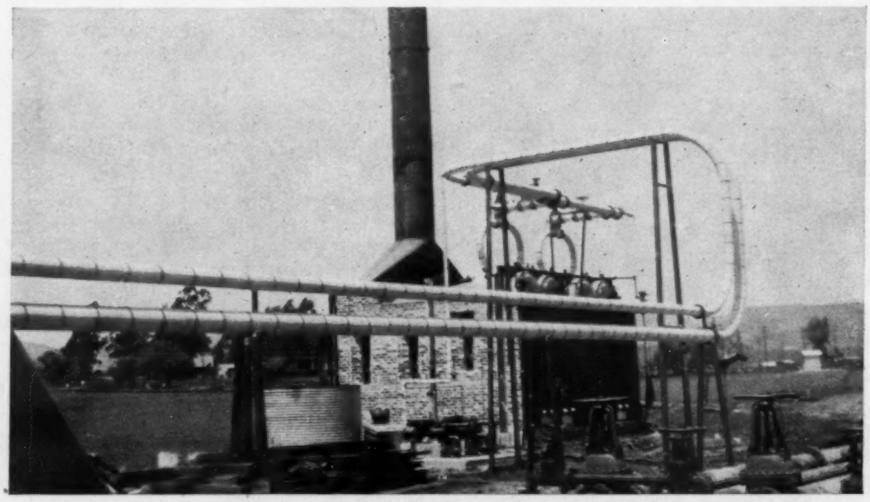
THE Cienega Corporation has recently started up what is believed to be the world's largest stripper plant. It is located at Saticoy, Ventura County, California, on the Ventura Fuel Company's line from the Ventura Avenue field to Long Beach. This line will operate normally with 400 pounds pressure on the Ventura end. The plant was designed and built by J. A. Campbell, natural gas engineer, of Long Beach, California, and consists of Campbell equipment throughout.

A great many problems enter into the design of a high pressure plant. First, the absorbers must be built to stand, with a high factor of safety, the tremendous strains of such high pressure. Since a part of this pressure is used to effect the movement of the fat oil through the interchanger and the pre-heaters into the stripper, which operates at only 30 pounds, means must be provided for safely reducing this pressure so that there is no likelihood of blowing up the stripper. Since, because of the high pressure, large quantities of gas are entrained in the oil and liberated in the stripper, means must be provided for compressing this gas to sufficient pressure to get it back into the line. Because of the fact that the gas going through the line has already been treated in low pressure plants and stripped of most of the heavier gasoline fractions, the product produced consists for the most part of the lighter fractions and has to be fractionated and blended to produce a gasoline of standard specifications.

There are few industries which in the past few years have made the strides that have been made by the natural gasoline industry. Only a short time ago rather crudely constructed stripper plants could go in on gas lines and make considerable production but during the past two years many of the old plants have been replaced by new and highly efficient installations or have been remodeled and equipped with the more modern designs of absorbers and strippers. Engineers are paying more attention to the cooling systems and using larger pumps and circulating more oil. As a result, the gas entering the stripper plants is getting leaner and leaner and it is only by using the most efficient equipment obtainable and giving the plants the best of supervision that those stripper plants not so fortunate as to be located on a main trunk line are able to operate at all.

The Saticoy plant has a normal capacity of 50,000,000 standard cubic feet per day, the estimated capacity of the line. The absorber installation has a maximum capacity of 70 million standard cubic feet. There is a block valve in the 16-inch line which passes through the yard and the gas is taken out through a meter run and after passing through the inlet centrifugal scrubber is distributed from the inlet header to seven oil froth absorbers, four feet in diameter by twenty-eight feet high. The gas, after passing through the absorbers, and being stripped of its gasoline content, goes out by way of the outlet header through another centrifugal scrubber and a second meter run back into the block valve.

The fat oil from each of the absorbers is controlled by a balanced valve actuated through a stuffing box by a heavy equalized float in the base of the absorber. These valves feed the oil out



Boiler installation at the Cienaga plant. Meter runs, for inlet and outlet gas, appear at bottom right hand corner

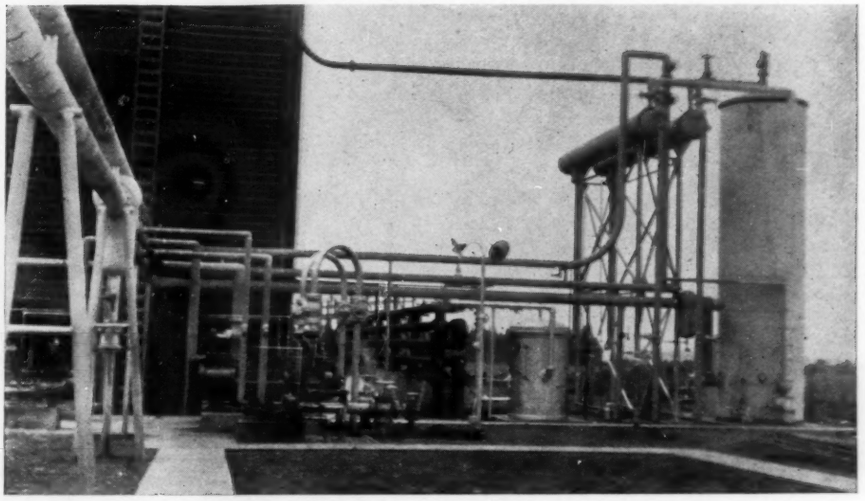
as fast as it comes down in the base of the absorber and serve as the first check in preventing the high pressure from getting to the stripper. On leaving the absorbers, the oil goes to a vent tank built to withstand 400 pounds pressure in case anything goes wrong with one of the absorber controls. This vent tank is also equipped with a float controlled valve which discharges the oil through a line leading to the heat exchanger. There is a back pressure regulator on top of this tank which is set for 150 pounds and any entrained gas released from the oil at this pressure passes through this regulator and goes to the suction of the recompressors.

After the gas oil has passed through one-half of the heat exchanger it discharges into another vent tank equipped with a float. This float is connected with a balanced valve on the gas outlet of the tank and is adjusted to carry a level above the oil outlet in such manner that when this level drops ever so little, the valve is partially opened and the gas escapes, lowering the pressure, which causes the level to rise. As a result of this control only a sufficient pressure is maintained in this tank to force the oil through the rest of the exchanger and the pre-heaters, and into the stripper. The gas from this surge tank also goes to the suction of the recompressors.

The heat exchanger is multi-tubular, having a total oil travel of 480 feet and being of such design as to give an exceptionally high heat transfer.

There are two pre-heaters of the pipe coil type, steam heated, and elevated about six feet above the water drums of the boilers so that the condensate can return by gravity. This not only saves the condensate but also eliminates the use of pumps to handle same.

Approximately 30 pounds pressure is carried on the stripper, which is of the "Oil Froth" design, and six feet in diameter, and contains four reflux re-wash sections in its upper part.



Pumping plant, heat exchanger, preheaters and stripper

The lean oil, after being forced through the outer shell of the exchanger, by the pressure on the stripper, goes to a 14x5¾x12 Gardner pump which discharges it through the oil cooling coil, through the high pressure oil meter where it is accurately measured, and is finally distributed to the absorbers by means of manometers placed across orifice plates. The gas distribution is effected in a similar manner.

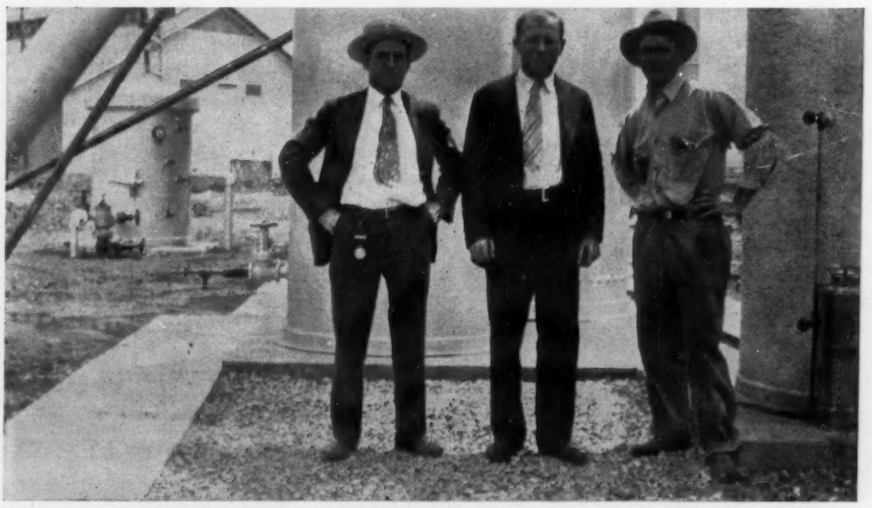
The dephlegmator consists of a partial condenser made up of 2-inch pipe coils in a shallow box which is built on top of the cooling tower. The box is built down one side of the tower, across the end and back the other side. The cooling is effected by the admission of cold water thermostatically controlled by a bulb located in the mist extractor into which the coils discharge through a 6-inch header in which they terminate. The water line supplying this box is a shunt line off of the line feeding the sprays at the top of the cooling tower. The vapors leaving the top of this mist extractor pass down inside the cooling tower to the gasoline condenser coils where they are converted into gasoline and after passing through a de-watering tank, go to the transformer, where they are blended with the light fractions condensed from the discharge of the recompressors.

The condensate from this partial condenser or dephlegmator consisting of water, light ends of the absorption oil and the heavier ends of the gasoline, is separated from the vapors in the mist extractor and passes down to a de-watering tank, where the water is separated and discharged by means of a carefully balanced float, and the mixture of gasoline and oil rises to the top of the tank, and flows by static head to the top of the stripper where it flows in on top of the reflux re-wash plates and refluxes the ascending vapors. Building the partial condenser on top of the cooling tower affords sufficient static head to accomplish this and no pump is required, the entire action being automatic.

The circulating water system consists of two Worthington 7½x8½x10 Duplex steam pumps, taking suction from the pit of the cooling tower and discharging through the spray headers. There are twenty 1½-inch New York Cooling Tower Company spray nozzles mounted on adjustable spray headers, located at the very top of the tower, and pointed down. The tower itself is 88x 20x36 feet high.

Two 250-H. P. McNault water boilers supply the plant with steam, only one being used at a time. The exhaust

(Continued on Page 65)



Snapped at the new Cienaga plant, left to right: J. A. Campbell, builder of plant; Eugene Tays, general superintendent, Cienaga Corp.; H. R. Otto, plant superintendent

PACIFIC COAST GAS ASSOCIATION

A Department Conducted by Clifford Johnstone, Executive Secretary

NOW It Can Be Told!

THE old belief that it is only woman who cannot keep a secret has been exploded by the revelations concerning the Santa Cruz Convention, which appear on this page. The secrecy with which our amiable Convention Chairman, Morris F. Wales, had hoped to surround his Convention plans, has been torn asunder and all through the babbling of various gentlemen who came to their knowledge by devious means. Hence we are able to print the actual letter written by John D. Kuster concerning a certain Barbecue, and to inform our readers that this Barbecue is not all that will happen in Big Basin on Wednesday, September the 14th. There will be entertainment of a startling nature and the assembled multitude may even be treated to the pleasure of seeing staid and dignified Executives chase the greased pig and run three legged races. But let us stop this rambling and get down to revealing all that has come to light. We learn on excellent authority that the following events will take place on the days specified:

PROGRAM

MONDAY, SEPTEMBER 12

8:30 a.m.—Registration Desk opens.
2:00 p.m.—Business Session (President's address, election of officers.)
4:00 p.m.—Executive Session, only open to Company members.
8:00 p.m.—First Aid Contest followed by dancing.

TUESDAY

9:00 a.m.—Accounting Section Meeting. Commercial Section Meeting. Public Relations Meeting. Technical Section Meeting.
12:30 p.m.—Luncheon program, featuring a 3-minute speaking contest between gas company men and women.
2:30 p.m.—General Session. (A few short talks by big men.)
4:00 p.m.—Tea and Reception for ladies.
8:30 p.m.—Convention Ball and entertainment.

WEDNESDAY

7:00 a.m. to Noon — Golf Tournament.
10:00 a.m. to 5:00 p.m.—Old Fashioned Picnic at Big Basin with Barbecue Lunch served at 1:00 p.m. Entertainment and Sports.
8:00 p.m.—Informal Dancing at hotel.

THURSDAY

9:00 a.m.—Accounting Section Meeting. Commercial Section Meeting. Technical Section Meeting. Public Relations Section Meeting.
12:30 p.m.—Luncheon program featuring 3-minute speaking contest between Appliance and Accessory men.
2:00 p.m.—Convention Photograph.
2.00 p.m.—Ladies leave for Bridge Tea at Brookdale Lodge.
2:30 p.m.—Joint Meeting of Commercial and Public Relations Sections. (Home Service and other ways of coddling the customer.) Technical Section Meeting
8:00 p.m.—Public Relations Stunts Night.

FRIDAY

9:00 a.m.—Commercial Section Meeting. Technical Section Meeting. Public Relations Section Meeting.
2:00 p.m.—General Session. (More talks of importance.) Ladies leave for scenic drive, including Big Trees.
6:30 p.m.—Annual Banquet.

The complete program, together with blanks for making Hotel Reservations and for entering the Golf Tournament will be mailed by the Secretary to all members about the middle of August.

Report of the Nominating Committee

L. M. Klauber

THE Nominating Committee wishes to report that it will place the following members in nomination for the offices designated at the Annual Election, which will take place on September 12, 1927 at Santa Cruz:

For President—L. M. Klauber, San Diego.

For Vice-President—Charles H. Dickey, San Francisco.

For Treasurer—D. G. Martin, San Francisco.

For Director—R. E. Fisher, San Francisco; N. R. McKee, Los Angeles; C. R. Miller, Portland; M. F. Wales, San Francisco.

C. H. Dickey

(Signed)

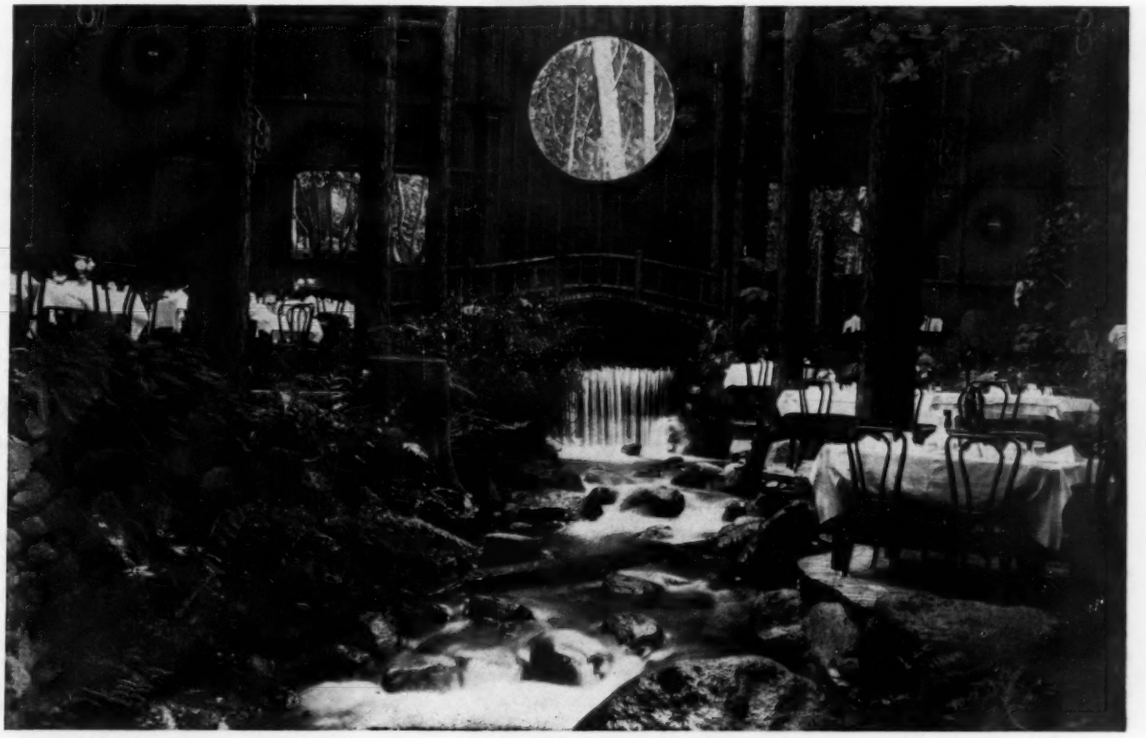
Nominating Committee: H. R. Basford, San Francisco; E. L. Hall, Portland; John D. Kuster, San Jose; W. M. Thompson, Pasadena; F. S. Wade, Los Angeles, Chairman.

The submission of names by the Nominating Committee shall not debar any member from making nominations for any and all of the separate offices, which nominations, if seconded, shall be submitted for balloting at the same time and in the same manner as those of the Nominating Committee.

Exhibits at the Convention

THE Advertising Committee of the Commercial and Public Relations Sections are cooperating in building up an exhibit of Gas Company and Gas Appliance Advertising. This will include Commercial, Financial and Institutional Advertising, photographs of Window Display and Billboard Advertising, House Organs and Year Books. A call has already gone forth to Company members to furnish material for this exhibit.

In an endeavor to foster interest in the Blue Star plan of the American Gas Association, an exhibit of Blue Star Appliances is being sponsored. No appliance will be permitted in this display which has not received the approval of the American Gas Association, and the exhibit should prove intensely interesting to all gas men as it will in many cases be our first opportunity to see the latest and best in the way of gas appliances. Owing to restricted space, only members of the Pacific Coast Gas Association are being asked to exhibit.



RIGHT: Redwood Terrace Gardens, Brookdale Lodge, where ladies attending the Pacific Coast Gas Association Convention will be entertained at tea.

Another kind of exhibit, but one of equal interest to many of our members, will be a display of golf prizes, these being furnished through the courtesy of W. M. Thompson, Chairman of the Golf Committee.

About That Barbecue!

AS intimated on another page of this issue, preparations extraordinary have been made for the barbecue which is to feature the outdoor day of the Convention. This barbecue, to be held in Big Basin, California's famous redwood park located in the Santa Cruz Mountains about 25 miles from Santa Cruz, is to be no common affair. In fact, it seems due to make Convention history, and sorry indeed will be the mental state of those absent ones who hear their friends tell about it!

John D. Kuster, a member of the Entertainment Committee, and a seasoned hand at barbecues, has the event in charge, and he appreciates his responsibility. His letter of instructions to the men who will stage this P.C.G.A. barbecue is incontrovertible evidence that it will be done right, in proof of which we offer the following quotations from the letter referred to:

"The menu is to be as follows:

"Combination Salad—Ripe Olives—Bread and Butter Pickles—Barbecued Meat (Lamb 70 per cent-Beef 30 per cent) (All meat to be carefully selected 7 or 8 days in advance of the barbecue and kept in refrigerators until wanted) —Chili Sauce—Spanish Beans—Corn on the Cob—Hot French Bread and Butter—Brick Ice Cream—Small Cakes —Coffee and Cream—Assorted Fresh Fruits.

"I want to particularly emphasize again, though I have already done it verbally, that this barbecue must be of an exceptionally high class and better than anything that you have ever attempted before. When I make that remark to you with all your experience, I know full well that you will not disappoint me and that the efforts you put forth in maintaining this high order of excellence will bring fame not only to yourself but to the Pacific Coast Gas Association for knowing how to entertain with a good old fashioned Spanish Barbecue.

"Remember that there will be guests there from all over the United States, and I want this particular part of the entertainment to go down in history as an event nearly as important as Lindbergh's history-making flight across the Atlantic.

"I have discussed with you the kind of Spanish beans we want, which must be better cooked and seasoned even than the good old Spanish dames could prepare them.

"The corn on the cob is another item that I am particular about, and if it is in season, I very much prefer that you use well selected golden bantam corn, and plenty of it. If this cannot be had, then my second choice, of course, will have to be the very best sweet corn that can be had.

"And almost as necessary as the well prepared menu is that you have plenty of help. Things must be served hot and in order to do this, it seems to be very essential that you have sufficient help to see that it is done.

"Insure that we will have plenty of everything, and so well prepared and served that this barbecue will be held up in future conventions as a model of excellence and something after which all entertainment committees may pattern."

We have quoted Mr. Kuster verbatim, though space prevented reproducing the entire letter, and enough has been said to indicate the outstanding nature of this particular Convention treat.

PHENOMENAL SALE FOR GAS APPLIANCE MANUAL

Owing to the fact that the second edition of the Association's Gas Appliance Installation and Service Manual was entirely sold out within two months, a third printing has been necessary. This little book, prepared by a committee headed by C. R. Miller of Portland, has become very popular throughout the United States and Canada and repeat orders are frequently received for it from Eastern gas companies. There are a number of companies both on the Coast and in the East which have each purchased more than one hundred copies.

The Gas Appliance Testing Code, published by the Association in 1924, also has a steady sale and copies of this book have recently been sent to Germany, Italy, South America, Australia and New Zealand.

EDITORIAL

A Northwest Gas Sales Organization Proposed

AT the Northwest regional meeting of the Pacific Coast Gas Association, held in Spokane this year, there was offered a suggestion that may develop into an important aid to the Northwest companies. This was the suggestion that companies of this section form a Northwest sales conference, for the interchange of ideas on sales problems of that region. Since James J. Ferrari of the Puget Sound Power and Light Company, first voiced this idea before the Spokane meeting, there has been considerable discussion of the plan's feasibility.

Western Gas, for one, would like to see this matter carried speedily to some conclusion. On the face of it it would seem that a Northwest sales conference could do effective work on certain common sales problems, of which that of electrical competition is the most outstanding. Some of the companies are originating successful methods for combatting this competition from cheap electricity, and a sales group from the companies concerned would make possible the interchanging of information on the individual companies' accomplishments.

Executives of the companies which would be interested in such a sales group should look into the possibilities for its service. Regional organizations of such special nature have succeeded elsewhere, and should in the Northwest.

Using Radio for the Gas Company

SEVERAL gas utilities of the Pacific Coast and neighboring states have at one time or another made use of radio advertising. As yet these efforts have been local in nature, and in this connection it is worth while to consider the experience of gas utilities in Greater New York and vicinity. Fourteen gas utilities, which formed the "Broadcasting Committtee of Greater New York Gas Companies," joined together in conducting a radio course in "The Art and Science of Home Making," through fifteen-minute morning lectures given weekly. Costs were shared on the basis of number of meters served by each company, and results obtained were considered very gratifying. Thirty-one thousand copies of a booklet prepared as a tie-in with the radio campaign were distributed in answer to inquiries which were received after only four and a half hours on the air.

Radio advertising has much to commend it to the gas company's consideration, but the fact that it cannot be strictly localized makes the New York companies' cooperative experience particularly significant for those interested in working this new and effective consumer appeal into the gas company program.

A Case of Poor Economy

COAL interests of various western sections which are considering the introduction of natural gas have aroused themselves to action, or at least, to originate propaganda directed against this impending loss of domestic heating and industrial markets. This reaction is nothing but natural on the part of the coal operators. It is a reflex of their well grounded fear that coal cannot hold its own in a highly competitive domestic and industrial fuel market.

The cause of industry and home, and that of national economy as well, will be advanced when coal is generally seen in its proper light as a raw material instead of a finished fuel. Coal has a logical and an assured place as raw material for gas making, and it will be in continually increasing demand as such. Natural gas, indirectly, is widening this potential demand for coal by popularizing new uses for gas at rates cheaper than possible with the manufactured product. Industry and the home will not return to solid fuels, when natural gas supplies dwindle. In the meantime, it is poor economy to allow our natural gas resources to waste away to give place to coal.

Gas Refrigerator Manufacturers in Print

GAS refrigeration "broke into print" in the advertising pages of a national weekly in July. Also, newspapers in western communities are beginning to carry advertising announcements from gas refrigerator distributors of the opening of sales in this territory. This consumer advertising is encouraging. There has been too little national advertising of gas-burning appliances in consumer media, and gas refrigeration is doing its bit to bring up the balance. Gas refrigeration adapts itself to effective advertising. It is essentially colorful and dramatic, and can be made to appeal to the imagination of the prospective refrigerator buyer even more than the now familiar electric article.

Aside from its definite influence on sales, this increased advertising for gas appliances will have a good psychological effect upon the whole industry.

Plant Inspection Makes *for* "Good Housekeeping" *of* Standard Gasoline Properties

By B. F. MASTEN
General Inspector
Standard Gasoline Company

WHEN an industrial concern begins to branch out, and establishes units of its system at many points, it finds the difficulties in the way of efficient operation to be decidedly greater than before. The smaller operator is not faced with the same demand for standardization, and his safety problems do not loom so large.

It has been found that inspection methods have much to do with meeting the situation. Standard Gasoline Company, operating 53 natural gasoline plants in California, has developed a very complete plant inspection system, and the article published on this page, describing the company's practice, should be of much interest to *Western Gas'* readers.

THE Standard Gasoline Company has carried the idea of inspection into the many gasoline plants owned and operated by it, and has so developed this means of increasing the efficiency that it has become a well established part of the company's operations.

The Standard Gasoline Company owns 53 casinghead gasoline plants lovated in Ventura, Taft and Southern California fields, 44 of which are in operation twenty-four hours of the day, with nine additional plants maintained ready to operate at short notice should conditions make added capacity desirable.

MONTHLY INSPECTION

Each of the 44 operating plants is inspected each month by a master mechanic who is thoroughly familiar with all machinery such as engines, compressors, pumps and boilers. All machinery is examined and inspected thoroughly, efficiently and in detail; engine and compressor operation is noted and a consultation held with the plant supervisor, who is advised of such cases where improvement is possible. Because of this frequent inspection there is no accumulation of slight inefficiencies—small troubles such as knocks are taken care of before they become large troubles—and the results have been very gratifying in the record of engine hours down.

It is true that a number of times a piece of equipment is shut down for repairs, but the length of time of shutdown is short, thereby lowering the hours down over a period of one year, and the ultimate aim of any plant operating twenty-four hours per day is a low "engine hours down" record per year.

The master mechanic is qualified to suggest and recommend the proper packing to use under difficult conditions, to advise methods of increasing the efficiency of all machinery, and he is often called upon to solve many knotty problems in regard to obscure troubles that have been worrying the operators.

In addition to the inspection made by the master mechanic there is another inspection made each month by an engineer who is thoroughly conversant with the absorption and distillation equipment. All equipment outside the engine room is thoroughly inspected, all leaks and faulty equipment commented upon, difficulties discussed with the plant men, and recommendations made to cover.

In addition to inspecting the mechanical equipment, all safety devices and first aid equipment are inspected; careful watch is kept of the fire extinguishers, such as foam, carbon tetrachloride and soda and acid, to insure that they are kept in proper order. Fire hose is inspected and fire hydrants kept clean; ladders are inspected and recommendations made for replacement or repair; and gas and gasoline equipment is carefully examined for leaks. Leaks in packing around valve stems or gage cocks are noted and immediate repair is made.

Periodical inspections are made by the manager, general superintendent and division superintendent, who make a general survey. These inspections are made at any time during the month, there being no set date for inspecting any one plant; consequently, there is no temporary cleaning up around the plants in order that a good impression may be made. The condition at any one time is the average condition throughout the month.

It is a well-known fact that constant attendance in one place makes a person blind to many things, due to their familiarity; for this reason the inspectors are welcome in any plant. Their suggestions and recommendations are for the assistance of the plant crew and the knowledge and experience of the inspectors is utilized to good advantage.

In order to create a spirit of competition and as a means of recognizing the good work done in keeping the machinery in order and the plant equipment and yard in a neat and orderly condition, a brass plate, set upon a mahogany plaque and inscribed with the words "Premium Plant," has been designed for each division and is presented each month to the plant receiving the highest grade in each division, determined by a percentage grade based on the results of the inspections. This presentation is made at the Supervisors' dinner, held in each division once a month. The "Premium Plate" is left in the custody of the Premium Plant for one month, or until the next Supervisors' meeting. If a plant is adjudged to be the Premium Plant two months in succession then the "Premium Plate" is returned to that plant to remain another month. Accompanying the "Plate" is a trophy consisting of a bronze crown approximately two inches in diameter, which becomes the permanent property of the plant receiving the "Plate" and is left in the plant when the "Plate" is removed to be placed in the temporary custody of some other plant. By this means each plant has a tangible permanent record that it has been adjudged the best plant. Naturally there is much competition to obtain as many crowns as possible.

Each division is divided into districts. Each district is under the direction of a District Supervisor. The Ventura Division consists of one district; the Taft Division consists of two districts, and the Southern California Division consists of three districts.

HONORABLE MENTION TROPHIES

Other plants may be in wonderful shape and be a credit to the crews which operate them, as well as to the company which owns them. To express a word of acknowledgement for their good work, trophies are also given to the plants whose rating is next highest, and one of these trophies is given for each district.

The second trophies, or honorable mentions, are stars of white metal approximately two inches in diameter and combined with the bronze crowns on the dark background of the board upon which they are placed and the brass "Premium Plate," form a pleasing color scheme.

(Continued on Page 63)

$25 Shares Give Impetus *to* Customer Ownership Activity *in the* West

Wider Market Results from New Stock Denomination

By GEORGE H. FINLEY
Managing Editor WESTERN GAS

A SIMPLE idea, if intelligently applied to a situation, will sometimes work a revolution in the old established order of things. This is as true in gas company operation as in any other industry, and we need look no farther than the field of company financing to see the force of such a revolution-working idea.

In 1914, when the first throes of war had extended their blighting influence into every channel of trade and finance, utilities were hard pressed to secure the new capital which is a constant necessity in any consistent expansion program. Banks, investment houses, stockbrokers —which had long been the customary outlets for utility securities—turned a deaf ear to company petitions in this time of emergency.

Then came the simple idea, when it was most needed. Marketing securities direct to users of utility service was the answer to the situation. A. F. Hockenbeamer, second vice-president and treasurer of the Pacific Gas and Electric Company, has been given credit for this basic vision which underlies the extensive customer ownership activities of gas, electric, street railway, and other types of utilities.

$8,800,000 SOLD THE FIRST YEAR

Customer ownership became a reality when the P. G. and E. organization performed the hitherto unheard of task of selling $8,800,000 worth of stock in its first year of activity. Literally thousands of buyers took only one share.

What originated in 1914 as a stern necessity has been encouraged in easier times on the grounds of good customer relations. Experience with customer ownership brought to light all of its inherent advantages, to company and consumer alike. To quote the Pacific Gas and Electric case again, that utility would value the proprietary interest its 39,000 stockholders feel in the company, far above any purchase price. Good will is an asset to any enterprise, and in the case of a utility, while the asset is too intangible to be submitted to measurement in cash, or cubic feet of sendant, it is a demonstrable fact that it is an essential to efficient operation.

Other utilities, the country over, were not slow to see the possibilities in customer ownership, and the movement spread like a wave, given momentum by the war-time stringency of finance, but popularizing itself as it went through the happy effect it had in bettering company-consumer relations.

EXTENDING THE IDEA

Now customer ownership is undergoing refinements, and it is with one of the most recent of these refinements that the present article concerns itself. A number of Western utilities, both gas and electric, have begun to sell securities in $25 units. This practice is not new in corporation financing, for stock of less than $100 par value, or of no par value, has been marketed by corporations for years. Several petroleum companies on the Pacific Coast have been among those using the $25 par value for their securities. But applied to utility financing the practice is new, particularly to the West.

In April of 1926 the Southern California Edison Company issued its first stock in $25 denomination. The Pacific Gas and Electric Company amended its articles of incorporation so as to introduce the $25 par on October 11, 1926, the change affecting both its first preferred and its common stock. Southern California Gas Company began to makket stock in $25 units on February 1, 1927, with the issue of 40,000 shares.

It is perhaps too early to draw hard and fast conclusions on this new device, but the evidence is preponderantly in favor of its use. It seems safe to predict that other companies will see wisdom in the practice, and that utility securities in denominations less than $100 will be widely marketed among users of utility service.

GOOD MERCHANDISING

To begin with, as long as it is deemed desirable to sell securities direct to consumers, the reduction of par values is in line with good merchandising. Twenty-five dollar shares open up new strata of buyers, for they give the small purchaser something tangible for his money—a completed purchase instead of an installment contract. To those who object to obligating themselves on time-payment arrangements this factor is a large one. And the new shares appeal equally to those who must buy them on the installment plan, for the period of payment is shortened measurably.

Good utility stocks are everywhere viewed as first class investment; their market price reflects this opinion, but when securities sell at a premium the small investor begins to think twice before he buys them. The "psychology" is all wrong for selling them in $100 units.

Figures bear out the plain fact that more consumers will buy $25 shares than will buy $100 shares. Since January 3 the Pacific Gas and Electric Company has added 2,200 new common stockholders. Of these, 670 have holdings of only one, two, or three shares—less than the former $100 par of the single share. Lowering the unit price has brought these 670 into the ranks of P. G. and E. share holders.

INCREASED SALES SHOWN

It is estimated by the Southern California Edison Company that the new par value has increased its stockholders at the rate of 30 per cent over the $100 share; and it has increased total sales, measured in value of securities sold, by 15 to 20 per cent beyond the figure which the company estimates would have been attained with the $100 par. Consumers to the number of 40,000 are buying $25 Edison stock on the installment plan at present writing.

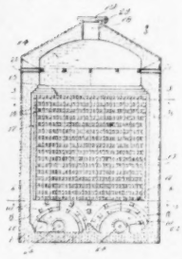
With utility stocks generally regarded as sound investments there is available a constant market for them through the financial channels used before the war. If the utility were engaged merely in the task of securing new money it would turn to these established sources—banks, investment houses—and might make an immediate saving in selling costs by so doing. The transaction would be a single transaction, and the investment banking house would then proceed to dispose of the issue through its outlets.

But taking the long view, what would the final result be to the utility? Its stock would be held in a few large

(Continued on Page 65)

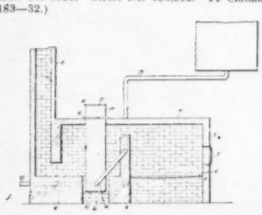
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,590,248. GAS GENERATOR. JOSEPH GIBSON, Los Angeles, Calif. Filed June 22, 1925. Serial No. 38,753. 7 Claims. (Cl. 48—74.)



6. An oil gas generator comprising combustion chambers, each having a roof formed by spaced arches, a gas off-take opening from said combustion chambers, the walls of the combustion chambers together forming a hexagon, burners positioned in opposite walls of each combustion chamber, a gas generating chamber above the combustion chambers, oil and steam inlet nozzles in the upper portion of the walls of the gas generating chamber, and checkerbrick in the gas generating chamber extending from the arches to below the level of the nozzles.

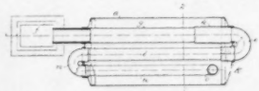
1,572,599. APPARATUS FOR PURIFYING GAS. HOWARD TOLAN GRAFTON, CARL WILLIAM WEESNER, and FLOYD JACOB HOFFMAN, Warren, Ohio. Filed Mar. 30, 1921. Serial No. 456,913. 14 Claims. (Cl. 183—32.)



1. A furnace for purifying gas having a preheater adapted to be heated by the furnace-gases, purification-chambers suspended from and entirely supported by the furnace-roof and means for delivering the gas from the preheater to the purification-chambers.

1,596,050. TAR-DISTILLATION APPARATUS. HEINRICH KOPPERS, Essen-Ruhr, Germany, assignor to The Koppers Development Corporation, Pittsburgh, Pa., a Corporation of Pennsylvania. Filed July 6, 1921, Serial No. 482,803, and in Germany Apr. 10, 1918. 4 Claims. (Cl. 122—74.) (Granted under the provisions of the act of Mar. 3, 1921, 41 Stat. L. 1313.)

1. In an apparatus for the distillation of tar and the like, in combination; a tar boiler, means for supporting said boiler at either end, fire tubes arranged longitudinally within said boiler and connected one with another by removable flue sections arranged exteriorly of said tar boiler, one of said fire tubes being arranged at one side of said boiler and connected to a source of fire gas supply, said source of gas supply being spaced from

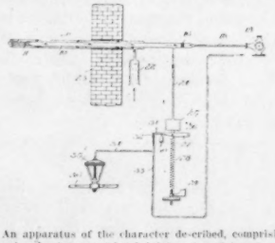


said tar boiler and another of said fire tubes being arranged at the opposite side of said boiler and connected with an outlet for said fire gases, one of said boiler supports being provided with means for compensating for the longitudinal expansion of said boiler during the process of distillation.

1,621,195. PROCESS FOR PREPARING A HIGHLY-ACTIVE CHARCOAL. OTTO ERNST and OTTO NICODEMUS, Hochst-on-the-Main, Germany, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed July 9, 1923, Serial No. 650,541, and in Germany July 15, 1922. 5 Claims. (Cl. 252—3.)

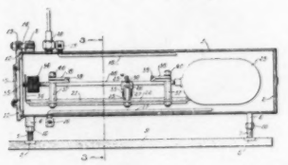
1. In processes for the production of highly active charcoal involving the carbonization of carbonaceous material in the presence of an acid of phosphorus the step which consists in carbonizing the impregnated carbonaceous material in the presence of a gas containing free oxygen in quantity sufficient to substantially prevent reduction of the acid of phosphorus.

1,630,318. APPARATUS FOR MEASURING THE FLOW OF GASES. KENNETH L. TATE, Rochester, N. Y., assignor to Taylor Instrument Companies, Rochester, N. Y., a Corporation of New York. Filed May 16, 1925. Serial No. 30,846. 6 Claims. (Cl. 73—32.)



2. An apparatus of the character described, comprising a chamber having constricted inlet and outlet passages, means for maintaining a predetermined difference in the pressures to which said passages are externally subjected, one of said passages being constructed relative to the other to maintain a pressure difference between opposite sides thereof adapted to maintain a maximum flow therethrough substantially independent of fluctuations in the external pressure thereon, and a device responsive to variations of pressure in the said chamber.

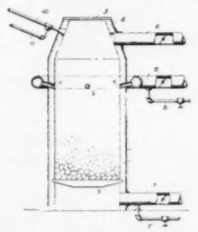
1,629,526. GAS GRAVITY BALANCE. HOMER ROLAND PIERCE, Bartlesville, Okla., assignor to Indian Territory Illuminating Oil Company, Bartlesville, Okla., a Corporation of New Jersey. Filed Feb. 19, 1926. Serial No. 89,340. 12 Claims. (Cl. 265—44.)



1. A portable specific gravity balance for gases comprising a gas container, a balancing beam having a displacement float, a pivotal support for said beam, and means independent of said support fixed interiorly of the container for removably mounting said support therein.

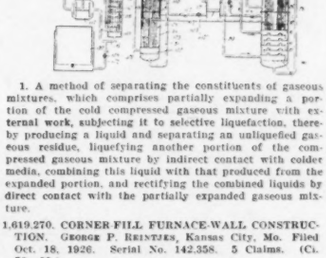
1,634,833. ART OF OPERATING WATER-GAS GENERATORS. FRANK A. HOWARD, Westfield, N. J., assignor to Standard Development Company, a Corporation of Delaware. Filed Apr. 1, 1920. Serial No. 370,510. 4 Claims. (Cl. 48—200.)

2. The improvement in the art of operating a water gas generator which consists in dividing the fuel in such generator into two superimposed zones, air blasting the lower zone separately, independently controlling the temperature of the upper zone, producing water gas in



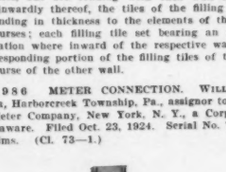
the lower zone, then introducing oil into the upper zone, and separately removing the vapors formed in said upper zone therefrom.

1,612,164. SEPARATION OF THE CONSTITUENTS OF GASEOUS MIXTURES. CLAUDE C. VAN NUYS, Cranford, N. J., assignor to Air Reduction Company, Incorporated, New York, N. Y., a Corporation of New York. Filed Jan. 26, 1923. Serial No. 615,036. 23 Claims. (Cl. 183—115.)



1. A method of separating the constituents of gaseous mixtures, which comprises partially expanding a portion of the cold compressed gaseous mixture with external work, subjecting it to selective liquefaction, thereby producing a liquid and separating an unliquefied gaseous residue, liquefying another portion of the compressed gaseous mixture by indirect contact with colder media, combining this liquid with that produced from the expanded portion, and rectifying the combined liquids by direct contact with the partially expanded gaseous mixture.

1,619,270. CORNER-FILL FURNACE-WALL CONSTRUCTION. GEORGE P. REINTJES, Kansas City, Mo. Filed Oct. 18, 1926. Serial No. 142,358. 5 Claims. (Cl. 72—39.)

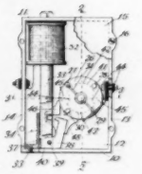


1. The combination with intersecting walls composed of conventional brickwork courses, of two sets of corner filling tiles, one set bonding with each wall and projecting inwardly thereof, the tiles of the filling courses corresponding in thickness to the elements of the brickwork courses; each filling tile set bearing an overlapping relation where inward of the respective wall, with the corresponding portion of the filling tiles of the next lower course of the other wall.

1,621,986. METER CONNECTION. WILLIAM H. KAISER, Harborcreek Township, Pa., assignor to American Meter Company, New York, N. Y., a Corporation of Delaware. Filed Oct. 23, 1924. Serial No. 745,485. 2 Claims. (Cl. 73—1.)

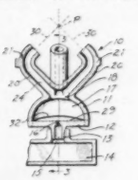
1. In a meter connection, the combination of a meter wall having an opening; a fitting having a connection upper end and having an open side with a surrounding face secured to the meter wall and sealed around the opening in the wall, said wall having a slit above the opening exposing a portion of the face of the fitting; and a sealing means uniting the fitting and the wall at the slit.

1,629,228. GAS-BURNER CONTROL. EPPA H. RYON, Pasadena, Calif. Filed May 8, 1925. Serial No. 28,947. 7 Claims. (Cl. 137—139.)



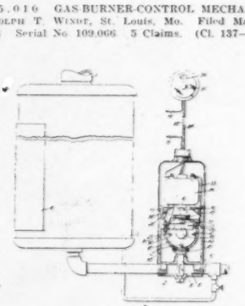
1. A gas burner control comprising a solenoid, a core slidable within the solenoid adapted to be attracted thereby, a stem having an aperture therethrough rotatably disposed in a gas line, means providing projections upon the stem, and a pawl carried by said core capable of engaging one of said projections when the solenoid is energized to rotate said stem a predetermined amount, said pawl having a flat side so arranged as to be engaged by a succeeding projection upon the stem so as to serve as a stop for the stem.

1,622,820. GAS BURNER. WILLIAM B. BASTIAN, Los Angeles, Calif. Filed June 30, 1926. Serial No. 119,572. 3 Claims. (Cl. 158—106.)



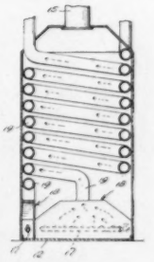
1. A gas burner, comprising: a substantially hemispherical mixing bowl; a cross-bar formed across the mouth of said bowl, the mouth of said bowl being open on opposite sides of said bar; a nipple formed upon said cross-bar, there being a passage for gas formed through said nipple and said cross-bar whereby a stream of gas is projected into said mixing bowl; and a plurality of burner tubes connecting with the upper portion of said mixing bowl and diverging from their point of connection, the ends of said tubes being turned inward so that all the burning streams of gas directed from said tubes meet at a point upon the axis of said burner.

1,625,016. GAS-BURNER-CONTROL MECHANISM. RUDOLPH T. WINDT, St. Louis, Mo. Filed May 14, 1926. Serial No. 109,066. 5 Claims. (Cl. 137—135.)



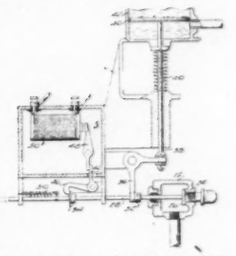
2. A device of the character described comprising a valve rotative successively in one direction, a pinion attached to said valve, a pinion supported on an axis at right angles to the axis of said first pinion and meshing therewith, a motor, a pinion rotative on an axis at right angles to the axis of said second pinion and meshing with said second pinion, a circuit for supplying energy to the motor, a switch for closing said circuit, and devices operated by said second pinion for opening said circuit and causing the motor to stop and hold said valve in closed position.

1,622,807. HEATING APPARATUS. THOMAS JEFFERSON PEACE, Nevada, Mo. Filed May 29, 1926. Serial No. 112,684. 1 Claim. (Cl. 126—116.)



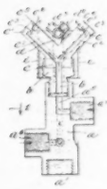
In a heating apparatus of the class described, a substantially rectangular casing, a hot air conducting pipe connected with the top of the casing, a plurality of burners disposed in the lower portion of the casing and associated with said front and side walls thereof, a substantially frusto-conical jacket for each burner, and a combustion and gas conducting tube connected with the flattened apex portion of each jacket, these tubes being coiled upwardly through the casing and the branches of the coils being disposed in proximity to the interior of the walls of the casing, and each tube being connected at its top with a flue, the coils of the several sets being arranged in nested relation.

1,596,040. HOT-WATER HEATER. PHILIP E. YOUNG, Fairhaven, Mass. Filed May 26, 1926. Serial No. 111,890. 4 Claims. (Cl. 126—351.)



1. In combination a gas-fired hot water heater, a gas valve, means for operating said valve comprising a water pressure control mechanism, a latch adapted mechanically to prevent the gas valve from opening irrespective of the operation of said water pressure control mechanism, a solenoid adapted to control said latch, a normally open electrical circuit including said solenoid, and circuit closing devices located at the service points for closing said circuit to move said latch.

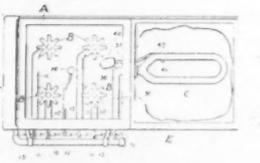
1,623,464. GAS JET AND MEANS FOR IGNITING SAME. ARTHUR V. CONOVER, New York, N. Y., assignor to Interflash Signal Corporation, New York, N. Y., a Corporation of New York. Filed May 11, 1926. Serial No. 108,239. 11 Claims. (Cl. 67—16.)



2. In a burner supplying gas for combustion in a single flame, a plurality of jets, means for causing the jets to impinge against each other and a plurality of pilot lights to ignite the jets.

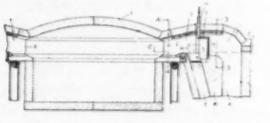
3. In a burner for supplying gas for combustion in a single flame, a burner fixture, burners carried by the fixture, means for supplying gas to the burners through the fixture, a plurality of pilot light burners carried by the fixture, and means for supplying gas to the lights through said fixture.

1,625,298. GAS STOVE. JACOB COPILOVICH St. Paul, Minn. Filed Oct. 15, 1926. Serial No. 141,729. 2 Claims. (Cl. 158—115.)



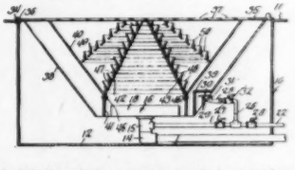
1. An automatic oven burner lighter for a gas stove comprising a burner within an oven, a valve for said burner, a gas pipe connecting said burner and valve, a flashing pilot light outside said oven automatically flashed and spaced from said pilot light and a lighter tube connected to said gas pipe and leading from below said hood to said burner for automatically lighting said burner upon the opening of said valve.

1,634,445. BURNER FOR FURNACES. WILLIAM G. BERGMAN, Point Place, Ohio. Filed Nov. 27, 1925. Serial No. 71,528. 10 Claims. (Cl. 158—109.)

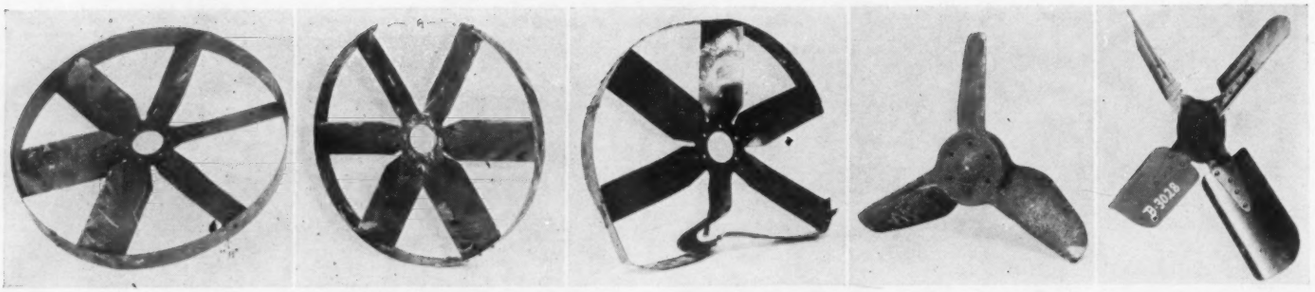


1. In a burner for furnaces, a combustion chamber and a gas mixing chamber, the gas mixing chamber having a mouth through which the gas mixing chamber communicates with the combustion chamber, the wall of the mixing chamber having a plurality of ports for admitting streams of air into the mixing chamber to form air streams located between planes that extend vertically and towards the mouth of the mixing chamber, and means for directing streams of gas between the layers of air streams.

1,623,487. GAS HEATER. ALBERT B. MILLER and WALTER H. KELLNER, Green Bay, Wis. Filed Apr. 14, 1926. Serial No. 102,014. 5 Claims. (Cl. 126—85.)



1. A heater of the character described, comprising a casing having integral bottom and side walls, an apertured cover resting upon the top edges of said side walls and covering said casing, a heater element within the lower portion of said casing, and an inverted substantially frusto-conical body secured to the under side of said cover and extending into said casing to and surrounding said heater at its inner end.



Illustrating Portland Gas & Coke experience with fans on five-ton truck equipment. Left to right, the views show: (1) Original truck fan ("A" shows how break starts); 2. Same, (Section of rim broken out, with no other damage); 3. Same (This fan broke and cut out several radiator tubes, doing $28 damage to radiator); 4. Truck aluminum fan, (Did not produce sufficient air to keep radiator cool); 5. Replacement fan which proved most efficient

Meeting Two Practical Automotive Problems

GAS companies do well to reduce their problems of automotive equipment upkeep to an exact science. When the truck and passenger car fleet of the single company is multiplied to equal the combined fleet of all the companies operating gas utilities in the land, it is easy to visualize the vast sums which are either being wasted, or saved, depending upon the degree of intelligent consideration given this matter of maintenance.

The Portland Gas & Coke Company has been a leader in this field. "Western Gas" had the privilege in the issue of December, 1926, of publishing an article by H. W. Drake, garage superintendent for that company, on "Automotive Transportation in the Modern Gas Company." We are glad to offer the following brief discussions by Mr. Drake of two specific problems of automotive maintenance, and the manner in which they have been solved in Portland.—Editor.

Fans *on* Five-Ton Truck Equipment

FANS on a certain make of truck had been causing more or less trouble for some time. Analysis of the report revealed the occurence of an alarming number of broken fans. It was not only necessary to replace the fans but the damage done to the radiators at the time the fans broke was such as to make extensive repairs necessary.

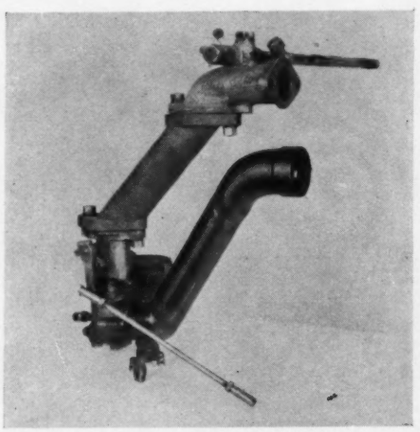
As soon as possible, several types of fans were installed and at the end of six months experimenting, we concluded that the fan shown in the accompanying photograph had sufficient strength to take care of our requirements. As a result, fans of this type were installed on all five-ton trucks. This was done so that the equipment would be well prepared for the peak loads in the summer months.

Not only did these fans prove successful, from the standpoint of eliminating breakage and damage to the radiators, but they have also eliminated all repairs made necessary on fan stand studs and cracked timing gear cases. This result was brought about due to two features which were incorporated in the fan; first, more perfect balance, which eliminated considerable vibration of fan and surrounding parts; and second, sufficient pitch of the blades to cause a better draft condition with a looser fan belt. On the original fan it was necessary to keep the belt at such tension that abnormal strain was caused on the fan stand stud and timing gear case.

By H. W. DRAKE
Garage Superintendent
Portland Gas & Coke Company

To date there have been no calls from the field on account of fan trouble and there have been no damaged radiators, fans or others parts adjacent to the fan.

The series of photographs above gives some idea of the difficulties encountered, the types of fans tried out, and the fan equipment now in service.



Showing extension on intake manifold

Eliminate Difficulty *with* Vacuum Fuel Tanks

VACUUM fuel tanks on touring cars are very satisfactory inasmuch as they do not cause trouble frequently. On commercial vehicles, particularly the heavier trucks, this has not been our experience. Recent analysis of repair work showed considerable expenditures towards the upkeep of these tanks.

After considering the matter for some time, it was thought that an extension on the intake manifold would solve the problem, for by lowering the carburetor we could depend on gravity feed for our fuel supply. After considerable experimenting, an extension on the manifold was finally developed which produces very good results.

The accompanying photograph shows the extension made on the intake manifold and the air intake fitting. It will be noted that the air intake was cut in two and a piece of tubing brazed in between. The brass casting between the carburetor and the intake manifold proper is the only new part which was made. The carburetor was lowered and because of the interference of the crankcase and steering mechanism, it was necessary to offset it. The starting of the truck was not interfered with in any way. After the installation was made, the trucks started very readily in the coldest weather. CO_2 tests were made of the exhaust gases and the same results were obtained after the improved manifold was installed as when the old system was used. This indicates that we did not in any way disturb the efficient operation of the vehicles.

Since this installation has been made on all five-ton trucks, no calls have been received from the field on trouble of this kind. This simple change or addition has eliminated all of the service trouble as well as having reduced the cost of operation by eliminating replacements of parts and adjustments of vacuum tanks.

5,000,000 CU. FT. GENERATOR FOR SAN DIEGO COMPANY

San Diego Consolidated Gas & Electric Company has begun the erection of a 5,000,-cu. ft. reversible twin shell oil gas generator. According to J. A. Herritt, superintendent of gas production for the company, the new unit is designed for future conversion or expansion to conform with changes in methods of manufacture which may be adopted in the future.

The San Diego company also plans to start construction of a 450,000 cu. ft. per hour electric driven Ingersoll-Rand compressor, and a 500,000 cu. ft. per hour exhauster.

HOFFMAN AND MELROSE GET JOINT OFFICE IN SPOKANE

Roy Hoffman, formerly assistant to the general superintendent, and Charles Melrose, formerly in charge of industrial fuel sales for the Spokane Gas & Fuel Company, have been appointed to jointly take over the duties of the late Walter C. Coakley, who was killed last month in a minor explosion at the Spokane plant.

TO SELL GAS APPLIANCES

Grabe Electric Company, appliance firm of Tucson, Ariz., has added a complete line of gas appliances, the new department being in charge of H. S. Wray, who for the last three years has been in sales work with the Tucson Gas, Electric Light and Power Company.

Southern California Meter Men Organize

FIFTY-SEVEN men primarily interested in the practical side of gas measurement met at the Elks Club, Anaheim, California, in an evening banquet gathering to organize what will probably be named the Southern California Meter Association, on July 28. The general meeting followed a preliminary session of July 14, when men representing 12 different Southern California companies assembled at Anaheim to discuss the formation of such an organization.

At the preliminary meeting temporary officers were elected, and this election was sustained by those attending the July 28 meeting. T. K. M. Smith, of the Industrial Fuel Supply Company, and the man chiefly responsible for launching the new association, was fittingly chosen to head it as president. As vice-president the meeting selected B. M. Laulhere, of the Midway Gas Company. R. N. Brown of the Union Oil Company is secretary, and E. Spencer of the California Gasoline Corporation is treasurer.

As its primary purpose the new organization will be interested in the gathering of data for practical use by the man working with meters, looking to increased accuracy in gas measurement. "Measurements" may be the subject of a first paper, to be presented before the association at an early meeting. Another session has already been called for August 25, at which will be completed final details of organization.

The association's by-laws committee is shaping up a constitution and by-laws, and will offer the whole set-up for ratification at the next meeting. Warren Bradford, of the West Coast Refining Company, is chairmaning the by-laws committee, which has this responsiblbe task in hand.

Other committee chairmen selected at the meeting of July 28 were as follows:

Committee on programs: W. M. Flesher, Standard Gasoline Company.

Committee on membership: H. A. Hurley, Midway Gas Company.

Committee on measurements: M. J. Cereghino, Los Angeles Gas and Electric Corporation.

Valuable work done in meter schools and short courses in the Mid-Continent and elsewhere leads the formers of the Southern California meter group to believe that there is a wide field of practical service for the organization in the betterment of gas measuring in their territory, and the social benefits to be gotten from membership in the body are also expected to give it an immediate popularity.

FIFTEEN COMPANIES REPRESENTED

Fifteen different companied were represented in the first general meeting, as named below:

General Petroleum Corporation, Standard Gasoline Company, Union Oil Company (Gas Division), Union Oil Company (Refinery), Los Angeles Gas and Electric Corporation (Los Angeles office), Los Angeles Gas and Electric Corporation (Seal Beach), California Gasoline Corporation, O. C. Fields Gasoline Company, West Coast Refining Company, Industrial Fuel Supply Company, Southern California Gas Company, Southern Counties Gas Company, City of Long Beach, Midway Gas Company, Barnsdall Oil Company, Shell Oil Company, Murphy-Dillon Company.

Attention of members and prospective members is directed to the next meeting, called for the Elks Club, Anaheim, Calif., probably at the hour of six-thirty, on August 25, the fourth Thursday in the month.

Foster & Kleiser
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TACOMA GAS & FUEL CO.
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Outdoor gas advertising in futuristic vein—Tacoma, Washington

Mountain States Power Is Outdoor Advertiser

One of the most enterprising of public utility advertisers is the Mountain States Power Company, which conducts gas service in Tacoma, Washington. John H. N. Adams, assistant sales manager for the utility, sends us the photograph reproduced above, illustrating the dramatic way in which the company has made its entrance into the field of outdoor advertising. Three bill-boards are posted by the Mountain States Power Company in Tacoma, and the copy shown above has only been in place for a few days. In the short time it has been on display it has attracted a great deal of favorable interest, and, the company feels, will be a big influence for sale of central plant heating by gas in the community this summer and fall.

At the recent annual convention of the Pacific Advertising Clubs Association at Portland, the Mountain States Power Company was awarded the trophy for the display of the most effective public utility advertising. Judging from the sample above, the award was well placed.

1927-28 Nominations *for* American Gas Ass'n. Heads

THE general nominating committee of the American Gas Association has placed the following names in nomination for 1927-28 offices:

For president—Oscar H. Fogg, Consolidated Gas Co. of New York, N. Y.

For vice-president—Bernard J. Mullaney, The Peoples Gas Light and Coke Company, Chicago, Ill.

For treasurer—Clifford E. Paige, The Brooklyn Union Gas Co., Brooklyn, N. Y.

For directors (two-year term)—H. C. Abell, Electric Bond and Share Co., New York, N. Y.; Chas. M. Cohn, Consolidated Gas, Electric Light and Power Co., Baltimore, Md.; J. S. DeHart, Jr., Isbell Porter Co., Newark, N. J.; F. C. Freeman, Providence Gas Co., Providence, R. I.; R. W. Gallagher, East Ohio Gas Co., Cleveland, Ohio; Arthur Hewitt, Consumers Gas Co., of Toronto, Toronto, Ontario, Canada; T. N. McCarter, Public Service Electric and Gas Co., Newark, N. J.; Francis H. Payne, Metric Metal Works, Erie, Pa.; H. S. Schutt, C. H. Geist Co., Philadelphia, Pa.

The following have been nominated to serve as section officers for the year 1927-28:

Accounting Section: Chairman, Edward Porter, The United Gas Improvement Co., Philadelphia, Pa.; vice-chairman, F. H. Patterson, Rochester Gas and Electric Corp., Rochester, N. Y.

Industrial Gas Section: Chairman, F. C. Mackey, Public Service Co. of Northern Illinois, Chicago, Ill.; vice-chairman, J. P. Leinroth, Public Service Electric and Gas Co., Newark, N. J.

Publicity and Advertising Section: Chairman, E. Frank Gardiner, Midland Utilities Co., Chicago, Ill.; vice-chairman, James M. Bennett, The United Gas Improvement Co., Philadelphia, Pa.

Manufacturers Section: Chairman, H. Leigh Whitelaw, American Gas Products Corp., New York, N. Y.; vice-chairman, John A. Fry, Detroit-Michigan Stove Co., Detroit, Mich.

Technical Section: Chairman, Walter C. Beckjord, American Light and Traction Co., New York, N. Y.; vice-chairman, H. E. Bates, The Peoples Gas Light and Coke Co., Chicago, Ill.

CALIFORNIA COMMISSION HEAD DIES, JULY 16

On July 16 occurred the death of Harley Walter Brundige, president of the California Railroad Commission since 1919. As California publicist, public utility commissioner and citizen Mr. Brundige had formed a wide circle of friends who are saddened by his sudden passing.

SURVEY BEGUN ON COLORADO GAS LINE PROJECT

A corps of engineers representing the Colorado Interstate Gas Company has established offices at Colorado Springs, and have under way a survey for the Texas-Denver pipe line project. E. C. McGee heads the engineer staff, which is from the firm of Ford, Bacon and Davis.

ILLUSTRATION:

Truckee River Power Company's display of gas appliances, set up in the Food Palace at the Transcontinental Highways Exposition which just closed in Reno, Nevada, is shown at the left. Appliance and cooking demonstrations were conducted by the company at this booth during the Exposition, and gas appliance literature was distributed to visitors from every state in the nation

Truckee River Power Exhibits Appliances *at* Exposition

By JOSEPH T. SULLIVAN

Supt. Gas and Water Departments, Truckee River Power Company

IN the "Biggest Little City in the World" there has been held a Transcontinental Highways Exposition to commemorate the completion of the last link in the Lincoln Highway.

The Exposition opened June 25th and closed August 1st and there were from 1000 to 6000 visitors each day to Idlewild Park in the city of Reno, Nevada, where the Exposition was held.

ABOUT THE EXPOSITION

Before describing the gas display at the Exposition, some more general information may be of interest. The principal displays were in the Nevada Building, California Building, Food Palace, Machinery Palace, Automobile Palace, and there was the usual varied collection of midway attractions.

An Indian village depicting the old frontier life was quite an attraction. The Nevada Building, situated in the center of the city of Reno, has excellent displays from every county in Nevada. The California Building, the most imposing in Idlewild Park, contained magnificent displays from the important counties in the State of California. The Food, Machinery and Automobile Palaces contained excellent displays, together with wonderful displays from surrounding states and cities. A substantial realistic miniature of the City of San Francisco attracted considerable attention.

To the gas industry the most important display was the gas appliance exhibit of the Truckee River Power Company facing the entrance to the Food Palace.

This display was arranged by Oscar Clifford, new business manager of the Truckee River Power Co., and included a variety of high grade gas appliances.

There was a complete gas kitchen installed which contained an enamelled gas range, with kitchen heater and automatic oven control; hot water was heated by a gas-fired automatic storage water heater; and there was a gas refrigerator. Grouped around the sides of the display were various models of gas water heaters, gas ranges and gas space heaters.

Cooking demonstrations by Miss Patricia Harding were well attended, while Mr. Howard McKissick, merchandise manager, explained the merits of the various appliances.

When demonstrations were given, the center of the display was cleared and chairs placed. The demonstrator baked biscuits, cookies, cakes or bread, and at the same time gave lectures on the proper methods of baking and the best ways to use the gas appliances. People, of course, were constantly coming and going. Some stayed throughout the entire demonstration. The food was given away at the end of each cooking session.

The demonstration, we believe was the best work we have done or will do this year and it has created a great deal of interest in the modern gas appliances. We secured hundreds of prospects for our various gas appliances and many have already been sold.

To every person entering our exhibit, we gave a small leaflet explaining our gas department and also a copy of our gas rates. About 5,000 were given out.

Not only did the display have a beneficial effect on appliance sales locally, but undoubtedly the visitors from the many states (and there were visitors from practically every state) will visit their local gas companies to purchase gas appliances similar to those that impressed them at our display.

GAS ON UPGRADE IN RENO

In conclusion, a few words about the gas situation in Reno. We have had so far this year a 13.0 per cent increase in gas sales. The increase for June was 15.0 per cent. In the past three months we have sold 65 of the finest type of gas ranges, 18 automatic storage water heaters and 69 other types of water heaters and 47 hot plates.

The gas business in Reno and Sparks, Nevada, has started on the endless upgrade in the face of stiff but friendly electrical competition.

L. A. GAS AND ELECTRIC HAS NEW VALUATION ENGINEER

Ralph U. Fitting, for the last three years in the valuation department of the Pacific Gas and Electric Company, has been appointed valuation engineer of the Los Angeles Gas & Electric Corporation. Prior to his connection with the P. G. and E. Mr. Fitting was with Parsons, Klapp, Brinckerhoff and Douglas, consulting engineering firm of New York City.

PLAN TO BRING GAS TO AUSTIN, TEXAS

The Lone Star Gas Company, Dallas, Texas, plans to extend its gas pipe lines from Temple to Austin, Texas, a distance of 80 miles, in the near future. The proposed extension will cost approximately $1,000,000. Gas will be distributed for industrial and domestic consumption.

OPEN OIL AND GAS BUREAU

The oil and gas bureau of the West Texas Chamber of Commerce, which was recently organized, has opened headquarters at Wichita Falls, with H. J. Adair in charge.

STIGLER FRANCHISE GRANTED

Stigler, Okla., by a vote of 274 to 9, granted a 20-year gas franchise to the Quinton Relief Oil & Gas company. The company agrees to start drilling operations within five miles of Stigler within thirty days and to be ready for service within one year. The company now owns production in the Quinton field and recently purchased the gas distribution system at Quinton, Okla.

HOUSEHEATING AND SENDOUT IN CHICAGO

A difference of one degree in the mean temperature of Chicago climate means a difference of 1,000,000 cu. ft. in the daily output of gas for that city.

PACIFIC GAS AND ELECTRIC ANNOUNCES DIVISION MGRS.

In a recent letter from the office of Frank Leach, Jr., vice-president and general manager of the Pacific Gas and Electric Co., official announcement was made of the division managers who will administer the new properties acquired by the company from the Coast Valley Gas and Electric Co., and the Western States Gas and Electric Co.

Jas. F. Pollard, formerly a vice-president of the Coast Valleys, will be division manager of the territory formerly served by his old company, with headquarters in Salinas. This district will be known as the Coast Valleys Division.

H. L. Jackman, with headquarters in Eureka, will administer the territory over which he had jurisdiction as manager of the Eureka Division of the Western States Gas and Electric Co. Under P. G. and E. ownership this territory is now known as the Eureka Division.

Charles S. Northcutt, division manager whose headquarters were in Modesto, has moved to Stockton, and is in charge there of properties acquired from the Western States Gas and Electric Co.

HOLD WATER HEATER SALES CAMPAIGN

THE Coast Counties Gas and Electric Company has just completed a successful campaign for the sale of automatic gas water heaters, which was participated in by all salesmen and employees of the company in the various Northern California districts. The campaign, which was conducted during the past two months, was competitive in nature, with four prizes for salesmen, and five prizes for employees not salesmen. In addition to the prize money, a straight 10 per cent commission on all sales served as an additional stimulus for effort on the part of the regular employees.

With the May and June bills attractive envelope stuffers were mailed out to the consumers, featuring water heaters for sale on a small down payment, long term contracts for the balance, and a liberal trade-in allowance on old equipment to be replaced. An allowance was arbitrarily set at $10 for any old tank or automatic heater, and $5 for any old boiler, regardless of their condition, as long as they were in use.

Morris F. Wales, general agent of the company, set the sales quota in advance of the campaign, and in every instance sales ran well over the anticipated number. The sales in the Contra Costa Division, for example, were 231 per cent of the quota.

In his bulletin announcing the prize awards, Mr. Wales took the opportunity to congratulate the offices on their fine work, commenting especially on the interest taken by employees other than salesmen, and the splendid results achieved.

ARKANSAS NATURAL GAS CO. BUYS INTEREST IN RESERVE

The Arkansas Natural Gas Company has acquired a part interest in the Reserve Company, at a cost reported to be around $2,000,000. The latter company owns and controls gas pipe line facilities in Louisiana, which will add to the distribution facilities of the Arkansas Natural.

The Wyoming Gas Company now has its office in Worland open, the community having recently been piped for natural gas. Service will begin about September 1. T. K. Bishop is in charge of the Wyoming Gas Company, which serves Greybull and Basin also, main offices being in the last named community.

Interior of Coast Valleys Division, P. G. and E. office at Salinas

New Headquarters Offices *at* Salinas, California

GENERAL offices of the Pacific Gas and Electric Company's Coast Valleys Division, formerly the Coast Valleys Gas & Electric Company are now quartered in new surroundings in Salinas, Calif. On March 1 of this year the company took over the Bank of Italy building in that community and began to reconstruct the interior. Work was completed and the building officially opened to the public for inspection in July.

The front of the structure as well as the interior was remodeled, the granite Corinthian columns being retained and stone cornices and roof balustrade carried across the front in keeping with the columns. Three large plate glass windows give a view into the south end of the first floor from the street. Over these show windows is concealed a battery of flood lights which will illuminate the entire front of the building at night.

A beautiful marble stairway inside the lobby of the building replaced an outside entrance to the second story, the stairs being guarded by an ornamental Spanish design grill work railing. An arched alcove underneath the stairway is piped for gas, water and sewer connections, and wired for electricity, providing facilities for demonstrating gas and electric appliances. Appliances will be displayed in the spacious lobby, shown in the illustration above. The lobby is finished in cream colored plaster with gray Tennessee marble wainscot and pink Tennessee marble floor.

During the formal opening of the offices the entire company staff was on hand to conduct visitors through the building, and to explain the workings of office equipment and appliances. Music was provided, and refreshments served.

SPRAY SAN DIEGO MAINS

An experiment has been under way in the low pressure distribution system of the San Diego Consolidated Gas & Electric Co., for the past six weeks. A stove distillate, atomized with a jet of high pressure gas, is being sprayed into the gas leaving the holders. This is only being done during the hours of heavy sendout. Although it is too early to note definite results from the work, the oil is disappearing, and those in charge of the experiment believe that it will result in reducing internal corrosion of the mains to a minimum.

WATER HEATER CAMPAIGN ON

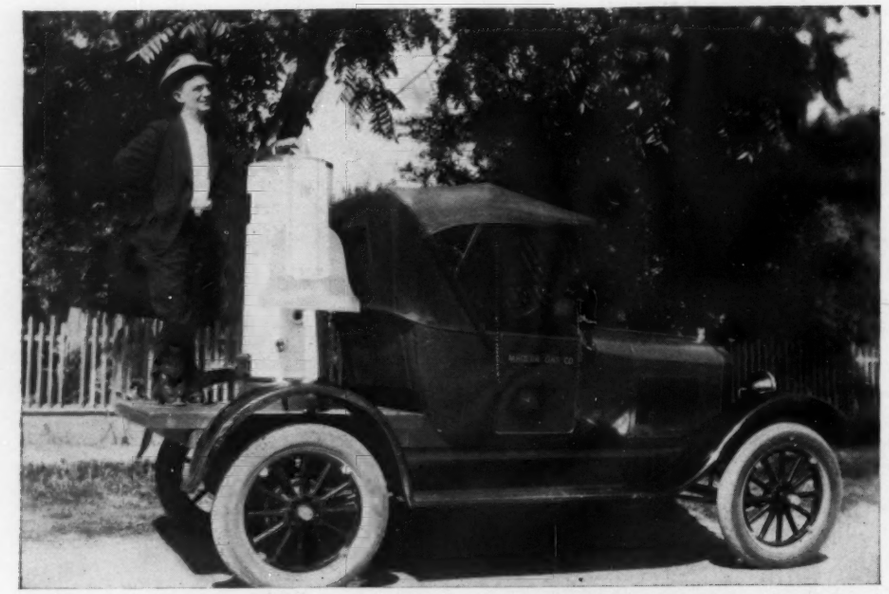
A crew of five salesmen, under L. J. Brundige, North Bay Division Sales Manager of the P. G. and E., is conducting extensive house-to-house activities to increase the sale of water heaters in the towns of Santa Rosa, Petaluma, Vallejo, Napa and San Rafael, Calif. Forrest U. Naylor, manager of gas sales for this company, reports very gratifying returns from this direct-to-the-consumer effort.

NEW HOLDER AT MONTEREY

Contract has been awarded to the Western Pipe & Steel Co. for a 500,000 cubic foot capacity, three-lift gas holder to be built in Monterey for the Pacific Gas and Electric Company. Work on the new holder is to start immediately, as the small 100,000 cubic foot holder in use when the property was acquired from the Coast Valleys Gas and Electric Co. is inadequate to properly handle the load required.

APPLY STUCCO TO BUILDINGS OF BELLINGHAM, WASH.

James J. Ferrari, superintendent of the gas department, Puget Sound Power & Light Company, Bellingham, Washington, announces that his company has just completed applying two coats of stucco on its condenser and purifier house, and the machine shop and pump room. These two structures are frame buildings, and the machine shop and pump house was recently converted from the old retort house from which the company's three horizontal benches were removed.



E. M. Marshall, Madera, Calif., and his "Auto Gas Appliance Demonstrator"

Taking Gas Appliances *to* Madera Housewives

MR. E. M. MARSHALL of the Madera Gas Company, Madera, Calif., has developed something effective in gas appliance selling, in what he calls his "Auto Gas Appliance Demonstrator." This is nothing less than an automotobile equipped to bring gas appliances to the housewife, as the illustration above shows.

In the very nature of the case water heaters and ranges are somewhat cumbersome and unwieldy. They cannot be demonstrated in vest pocket editions, and it isn't always possible to persuade the prospect to come to company headquarters to make the personal inspection which must precede the sale. To quote Mr. Marshall on this point, he says that "Formerly we took photographs and when we could find the lady at home she admired same and agreed at some time in the future to come to the office and see the appliance demonstrated. Sometimes she came."

So it was decided to "take the mountain to Mahomet," and a Tappan gas range with regulator and insulated oven, and a Welsbach automatic water heater were installed on an automobile. "Now," continues Mr. Marshall "I drive into the back yard and regardless of dust caps and kitchen attire the lady of the house sees the stove, all its parts and how it works. In many instances we go back with contract signed on the dotted line and a few hours later all concerned are truly happy.

"My next step will be to install a tank of compressed gas on the car so that the demonstration can be made regardless of whether the housewife is using gas or not.

"Our sales have increased five-fold since we began to use the 'Auto Gas Appliance Demonstrator'."

GAS ASSOCIATION MERGER IS APPROVED BY A.G.A.

The merger of the Natural Gas Association of America and the American Gas Association, approved at the May convention of the former and announced at the time, has been approved by the executive committee of the American Gas Association, which is preparing to ask approval by the membership of that organization by submitting necessary constitutional amendments for consideration. When this has been approved N. C. McGowen of Shreveport, elected president of the Natural Gas Association at the Cincinnati convention in May, will become chairman of the managing committee of the Natural Gas Department of the A. G. A.

The following official joint statement announcing the consolidation was made on July 25:

"To the Gas Industry of America":

"We take pleasure in announcing that, all essential details being complete, the Natural Gas Association of America and the American Gas Association are amalgamated into a single body under the name of the American Gas Association, Inc., as of August 1, 1927.

"All elements of the gas industry in North America, manufactured and natural, are now one body united for the advancement of the industry and the development of its usefulness to the people whom it serves."

ALEXANDER MACBETH,
President, American Gas Ass'n.

N. C. MCGOWEN,
President, Natural Gas Ass'n of America.

NEBRASKA TOWNS SEEK GAS

Scottsbluff, Nebraska, has been negotiating with oil companies operating in the Lance Creek field of Wyoming for natural gas for domestic use. Lusk, and other towns in the Platte River valley, are also interested in securing gas.

IMPROVE AUGUSTA SYSTEM

The sum of $40,000 is going into rehabilitating gas mains of the Western Distributing Company in Augusta, Kansas, according to J. C. Mawson, local manager.

SHIP GAS BY-PRODUCT TO DISTANT POINTS

Ammonium sulphate is being shipped from manufacturing plants of the Laclede Gas Light Company, in St. Louis, Mo., to Hawaii and Japan to be used as fertilizer. This fertilizer, which is a crystalline substance resembling white sand or salt, is obtained by treating ammonia, a by-product of coal gas manufacture, with sulphuric acid. It is being used extensively on lawns, golf courses, and on fields in which food crops are to be grown and where the soils are deficient in nitrogen.

One shipment of this ammonium sulphate soon to be made by the Laclede Company to Yokohama will consist of 336 tons. It is shipped in sacks, 200 pounds to the sack.

EMPLOYEE BENEFITS

On July 1 the British Columbia Electric Railway Company, which provides Vancouver and Victoria, B. C., with gas, inaugurated a death benefit plan for company employees. Payment of $1,000 will be made on the death of employees over 21 years of age, who have been with the company for at least five years.

There has also been put into operation a plan for helping employees to own their own homes. Loans are provided for employees who wish to build homes, providing the employees have been with the company five years or more.

PUBLIC UTILITY ADVERTISING ASSN. ELECTS NEW HEADS

B. J. Mullaney of Chicago was elected president of the Public Utilities Advertising Association, at that organization's annual convention at Denver, Colo. He succeeded Frank LeRoy Blanchard, New York. J. Charles Jordan, Pacific Gas and Electric Company, San Francisco, was elected first vice-president; Donald Mackie, Jackson, Mich., second vice-president; J. M. Barnes, New Orleans, third vice-president; John F. Weedon, Chicago, secretary; Charles W. Person, New York, treasurer. Directors of the organization, newly-elected, are: Joseph E. Moorehead, Denver; George F. Oxley, New York, and E. Frank Gardiner, Chicago, three-year term; George Ade Davis, Oklahoma City, two years; James Lightbody, Vancouver, B. C., one year.

GAS APPLIANCE BANQUET

On Thursday, August 4, the Gas Appliance Society of California will hold its regular summer banquet, incidental to the Summer Furniture Market to be held in San Francisco during that week. The summer meeting of furniture dealers brings a large number of merchants to San Francisco who are also interested in the sale of gas appliances, and for this reason it has proved satisfactory to have the meeting of the State Advisory Board of the Gas Appliance Society at that time. George Glans, of the McKinley-Glans Furniture Co., San Jose, who is president of the society, will act as chairman.

HOUSTON COMMISSIONERS HAVE APPROVED HIGHER GAS RATE

City commissioners of Houston, Texas, have approved the application of the Houston Gas & Fuel company to advance the gas rate to domestic consumers from 65 cents to 80 cents per M. cu. ft. The meter service charge is advanced from 50 to 75 cents. The company buys at the city gate from the Houston Gulf Gas company, the latter company transporting the gas from the Refugio county fields.

here "it" is!

the GAS HEATROLA

that public demand created

THOUSANDS of requests from communities where gas is available, coming in steadily during the past six years, have literally forced us to build this new Heatrola for gas.

We might have hurried on to the market with a gas-burning Heatrola two, three, four years ago. But much development work was necessary—we wanted to be sure. For this new home-heater must be worthy of the name Estate.

Now we offer a gas-burning Heatrola which is in every respect true to the high standards which have made the name Estate Heatrola synonymous with "comfort," "convenience" and "beauty" in tens of thousands of homes.

The Estate Heatrola is known everywhere—enthusiastically known. And in every community, people are anxious to replace their present one-room, two-room gas heaters, with a modern heater, like the Gas Heatrola—one that circulates warmth through the whole house.

The market for the Gas Heatrola is ready-made. Remember every Gas Heatrola sold will mean more gas consumed — turn the page, read the news!

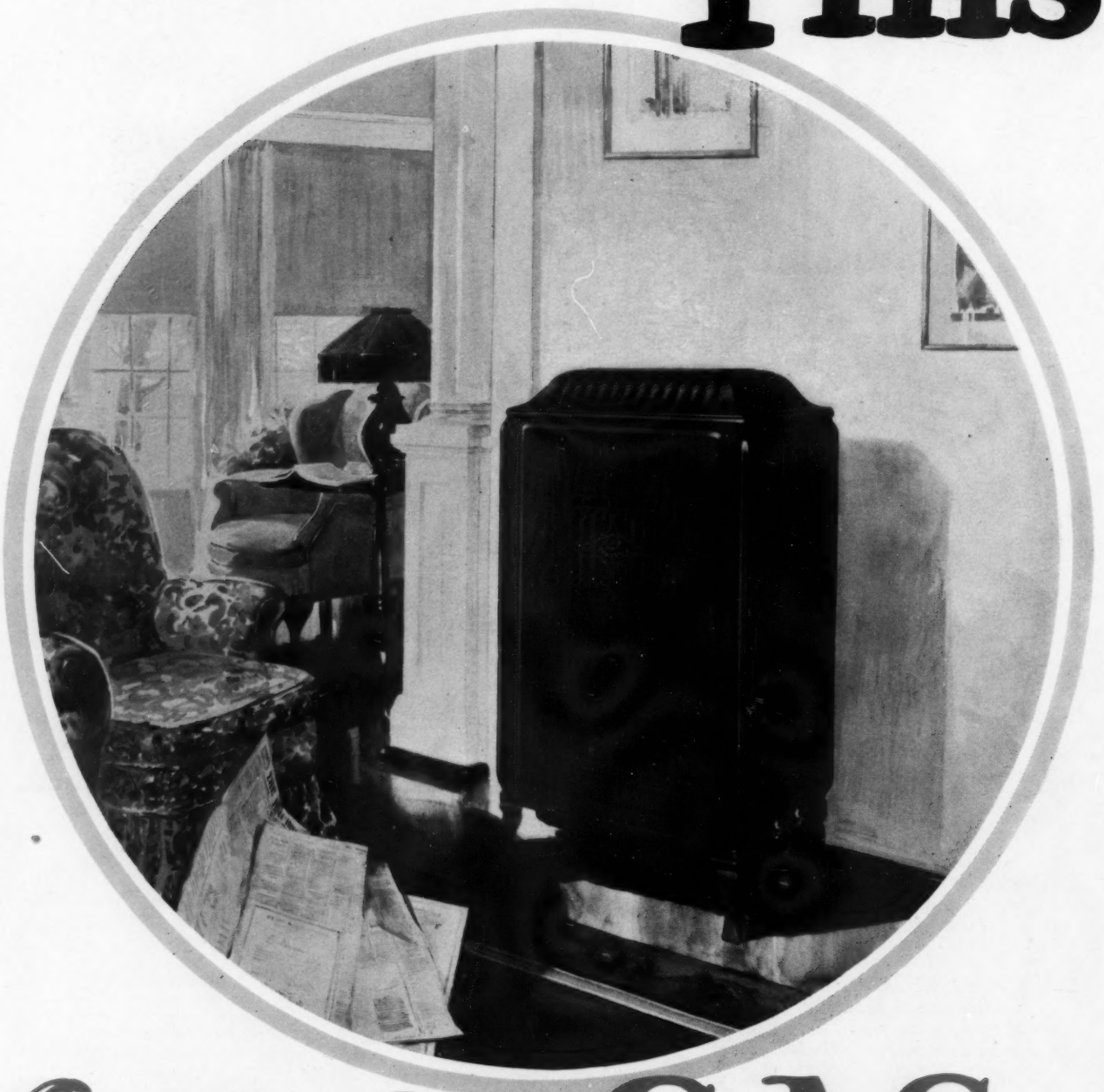
THE ESTATE STOVE COMPANY, Hamilton, Ohio

House Founded 1845

San Francisco: 180 New Montgomery St. Portland Oregon: 829 Terminal Sales Bldg.

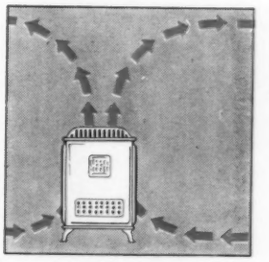
This

THE new Gas Hetrola—for complete heating of small homes, in communities where either natural or manufactured gas is available.



Estate GAS HEATRO

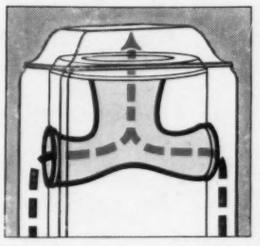
is "it"



Like a furnace, the Gas Heatrola circulates a great volume of healthfully moistened air throughout the rooms. It heats all rooms uniformly, quite different from old-time heaters that toasted you on one side and let you freeze on the other. Heatrola heat is safe heat, too. No fumes or odors can possibly escape into the house. A big talking point!

THIS beautiful mahogany-finished cabinet is a new and entirely different gas heater. It is the Estate Gas Heatrola. It *circulates* heat throughout the entire house. It antiquates the "stove-a-room" heating method. It is a handsome piece of furniture. Its vitreous enamel finish (grained to resemble natural wood) is everlasting, and can be kept bright and new-looking with a dust cloth!

And it is a *Heatrola*. It has the famous and exclusive Intensi-Fire Air Duct—the heart of its Double Air-Circulating System. It has a Vapor Tank to keep the heated air healthfully moist. It is fume-tight. It embodies all the features that have made the Estate Heatrola the most popular home-heating plant in the world.



The Gas Heatrola operates on a double air-circulating system built around the famous Intensi-Fire Air Duct. This unique device, exclusive with the Estate Heatrola, is located directly in the path of the flames and absorbs and blocks much of the heat that the ordinary heating device or furnace allows to escape up the chimney. The Intensi-Fire practically doubles the heating capacity of the Gas Heatrola—without using an extra foot of gas.

Six years of successful selling and six years of national advertising are behind the Gas Heatrola. Naturally, you can see what a merchandising opportunity it offers.

SPECIFICATIONS

Catalog No.	100
Height over all	42¼"
Width over all	23½"
Depth over all	17"
Shipping weight	250 lbs.
Rated Capacity	50,000 B. T. U. per hour

Of course, the Estate Gas Heatrola will wear the Blue Star—the emblem of approval by the A. G. A. Laboratories.

LA

FOR YOUR CONVENIENCE

Fill in other side ot this coupon.
Enclose in envelope and mail to

THE ESTATE STOVE COMPANY

Hamilton, Ohio

San Francisco: 180 New Montgomery St. Portland, Ore.: 829 Terminal Sales Bldg

Millions *will be told about the* New GAS HEATROLA!

This coupon will get action . . . Tear it out . . . MAIL IT!

The Estate Stove Company
Hamilton, Ohio

Gentlemen:

Please send us complete information about the new Gas Heatrola:

Name .....

Company Name .....

City ..... *State* .....

Position .....

IN The Saturday Evening Post, The Woman's Home Companion and McCall's Magazine, we are going to tell women about this new Heatrola. They know the name, Estate. They know that it stands for the best in home-heating. They will accept the Estate Gas Heatrola without question . . . With such a market—such a product—and the enthusiastic efforts of your merchandising organization, there is but one answer. Write today for complete details. Even with our great manufacturing facilities, we cannot promise to meet the demand as promptly as we would like to.

THE ESTATE STOVE CO.
House Founded 1845
Hamilton, Ohio

LOOP FROM TEXAS LINE TO BRING GAS TO FOUR TOWNS

The West Texas Gas Company, subsidiary to the Prairie Oil & Gas Company, has been granted franchises at the towns of Idalou, Lubbock County, and Lorenzo, Ralls and Crosbyton in Crosby County. A loop from the main line from the Panhandle section to South Plains, Texas, will be constructed for the purpose of serving the four towns. Many irrigation pump stations in this section will be operated by gas fuel, and gas will be offered for such industrial purposes as require it.

SIXTY-MILE EXTENSION UNDER WAY FOR LONE STAR

Construction work is under way on the Lone Star Gas Company's Central West Texas gas system from Valera, Coleman County, to Winters and Ballinger, Runnels County. It is reported that the line may be extended further westward at a later date. About 60 miles of 10-inch pipe will be used in the present extension. A portion of the shallow gas production in Coleman County will be afforded a market through this extension of Lone Star's distributing facilities.

P. G. AND E. STARTS REFUND

To the 140,000-odd consumers that were on the P. G. and E. gas lines from July 1, 1914, to June 30, 1916, the company is making arrangements for refunds that will total in the neighborhood of a million dollars. This is in accordance with a final decision of the courts in the long drawn action of the P. G. and E. versus the City and County of San Francisco. This represents the difference between the rate charged and the rate of 75c per thousand as prescribed by city ordinance, plus interest of 7 per cent per annum. The gas company will commence making payments about September 1, and will conclude making payments within nine calendar months after June 14, 1927.

Conspicuous advertising in the daily papers, with information coupons to be filled in and mailed to the gas company, is being employed to facilitate the refund.

TULSA IS MEETING PLACE FOR 1928 UTILITIES CONVENTION

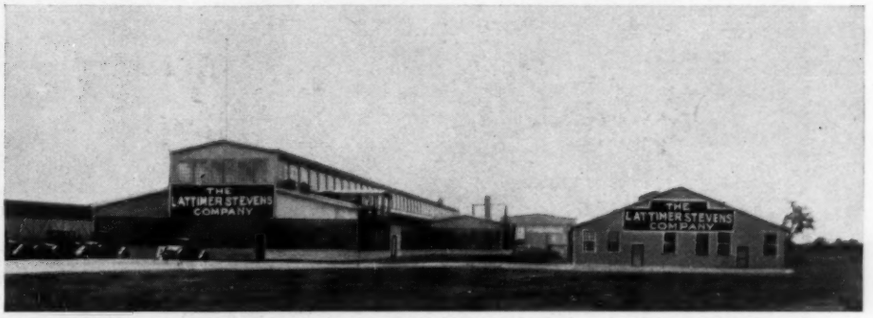
The tenth annual convention of the Oklahoma Utilities Association will be held at Tulsa, March 13, 14 and 15, 1928. This was decided by the Executive Board of the Oklahoma Utilities Association at a meeting in Oklahoma City, July 19. Between eight and nine hundred utility people, representing every branch of the industry, are expected to attend the convention, according to E. F. McKay, manager of the Association.

L. S. LAWSON IN S. F.

L. S. Lawson, of the Lawson Heater Co., Pittsburgh, Pa., has just left San Francisco after a brief stay, during which time he called on some friends in the gas industry and his distributor in Northern California, James Hambly and Sons. Leaving San Francisco, he went to Los Angeles, where he will sojourn for a few days before returning to the East.

PORTLAND PROPERTIES UNDERGO VALUATION

Valuation proceedings are under way on the properties of the Portland Gas & Coke Company, as a completion of a valuation started some years ago by the Oregon public service commission, and discontinued from lack of funds.



Lattimer-Stevens Company's new factory home, Columbus, Ohio

Lattimer-Stevens Company of Columbus, Ohio, will be completely installed in its new plant in a manufacturing section on the outskirts of that community by the first of August. The plant consists of three buildings on a six and one-third acre plant site, with a railroad switch running through the center. There is a total floor space of 50,000 square feet, the main building being approximately 100 feet by 350 feet.

Complete facilities are provided in the new plant for production of all articles manufactured by the company, from raw material to finished product. Gas will be used in the operation of both iron and brass foundry. According to E. M. Stevens, vice-president of the company, the company hopes to demonstrate an important field for the use of gas in iron melting, where it has been little used in the past, though its use for brass melting is common. The company feels that gas use will result in a better and more uniform grade of iron, avoiding the absorption of impurities so common when coke is used for melting.

A laboratory for testing materials which go into Lattimer-Stevens meter connections and the company's other lines, is to be operated at the new plant, and various long-time tests for the finished products are to be evolved, duplicating the conditions of actual service as nearly as possible.

COMMISSION ENGINEER IS NOW COMPANY EXECUTIVE

Much interest is being shown throughout utility circles in Oklahoma in the resignation of B. P. Stockwell, gas and electric engineer of the corporation commission for the past seven years, to accept appointment as manager of the Southwest Pipeline and Southwest Production company, and Bristow and Drumright divisions of the Oklahoma Utilities company with operating headquarters at Bristow. These companies are controlled by the Electric Public Service company of Chicago, under management of the Utilities Management company, of which R. A. Pratt is president and Chester P. Wilson, general manager. The properties include gas distribution at Bristow and Drumright and gas production and transportation in the Bristow-Drumright region, and also a natural gasoline plant.

Mr. Stockwell, who assumed his new duties July 1, has been succeeded on the Oklahoma commission by V. M. Cone, an engineer of Tulsa. Mr. Cone was at one time with the United States Department of Agriculture for twelve years, later entering private engineering work, and specializing in the oil and natural gas field.

ELECTRIC RATES CLAIMED LOWER THAN IN YEAR 1913

The rate research committee of the National Electric Light Association has prepared a chart, based upon commodity and cost of living prices given out by the U. S. Bureau of Labor Statistics, showing that electricity in 1926 was sold to the domestic consumer at a cost fifteen per cent less than it was sold in 1913.

NEW LOCATION

The Pacific Gas Heating Co., which has been located for a number of years at 469 Sutter street, in the building adjoining the old P. G. and E. building, has been obliged to seek a new location due to the razing of the stores in which they were located. The new address of the Pacific Gas Heating Co. is 424 Sutter street, San Francisco.

COAST BUILDING OFFICIALS IN CONFERENCE

On July 22-23, in Oakland, the Pacific Coast Building Officials held a conference. Representing the Pacific Coast Gas Association was F. U. Naplor of the P. G. and E. The conference is working at the present time to formulate a standard or model building code, suitable for adoption by all Coast cities, and it is the desire to insure the proper sections being written in to deal with the installation of gas appliances that explains the P. C. G. A.'s active interest.

BUY PAMPA UTILITY

Peabody, Houghteling and Company of Chicago have bought the Pampa Gas Company, serving Pampa, White Deer and Panhandle, Texas, with natural gas. The Pampa organization becomes the southwestern division of the Federal Public Utilities Company, controlled by Peabody, Houghteling and Company.

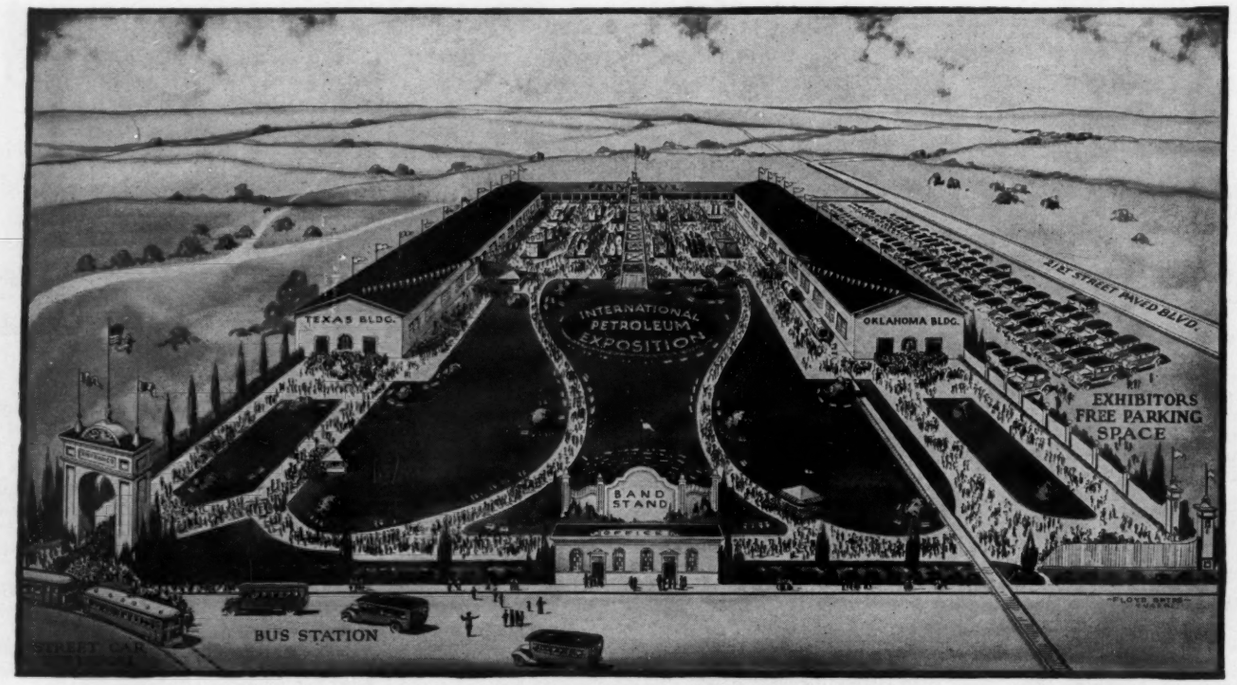
INSPECT INDUSTRIAL PLANTS AT A. G. A. CONVENTION

A feature of the Ninth Annual Convention of the American Gas Association, to be held at the Hotel Stevens, Chicago, Ill., October 10 to 14, will be inspection trips to many of the manufacturing plants in which gas is used for heating.

These trips are being arranged by the Industrial Gas Section of the Association to give the members a chance to inspect the city's varied gas installations in actual operation. Those interested in making inspections tours of Chicago's industrial plants should communicate with D. W. Chapman, manager, industrial sales, The Peoples Gas Light and Coke Company.

"GASLESS DAY" IN WICHITA

July 19 brought something unique to the gas industry, in the form of a "gasless day," declared in Wichita, Kansas, as an official protest of housewives against a raise in gas rates ordered for this month by the Wichita Gas Company.



Plant of International Petroleum Exposition, on new grounds in Tulsa, Okla.

CONDUCTED along slightly different lines than in the past, the International Petroleum Exposition will again be staged this year in Tulsa, Okla., containing many features of interest to gas men as well those concerned primarily with oil. Dates for the Exposition are September 24 to October 1. A 20-acre tract will this year form the setting for the new exposition program. No amusement offerings will be made this year, and the absence of spectacles and pageants such as have featured the Exposition in the past is expected to give the occasion a strictly business atmosphere. Relocation of the display grounds has made it possible to considerably enlarge the plant.

Safety work in the oil and gas industry is to come in for special consideration, with schools, contests and drills arranged for at the Exposition. A list of exhibitors has already been announced, and there will be a wide range of equipment on display. The Exposition management has reserved a large space for the museum and geological displays.

Secretary Herbert Hoover has been asked by the Mid-Continent Oil and Gas Association to speak at the annual dinner in connection with the Exposition.

FOUR COMPRESSOR STATIONS UNDER CONSTRUCTION

Four new compressor stations with a total capacity of 16,000 horse-power are in process of erection by the Empire Natural Gas Company in connection with the construction of its 20-inch Amarillo line. Three of these stations will be on the line proper, and the fourth is being erected near Ottawa, Kansas.

Work on the Ottawa station started about June 1. A few days later work was started on the station near the Wichita terminus of the first 250-mile section of the Amarillo line. Following this work was commenced on the station near Pampa, on the Panhandle end of the line and work is now being commenced on the excavations for the erection of the station mid-way of the line, near Moorland, Oklahoma.

The Empire Company is also adding a 1,000 horsepower unit at its Tallant, Oklahoma, compressor station, which will be in operation early in the fall.

At Petrolia, Kansas, one of the large stations on its main line to Kansas City and other northern points, seven new aftercoolers suction discharge manifolds are in process of installation.

Detailed plans are also underway for the building of a gasoline plant, near Wichita, in connection with the gas compressor station at this place. This plant will have a 10,000-gallon daily capacity.

CHEMISTS TO CONSIDER GAS

The American Chemical Society, meeting at Detroit, Mich., during the first week in September, will conduct a symposium on the chemistry of industrial gas.

RECOGNIZE LONG SERVICE

E. F. Hannah, superintendent of the gas division of the Springfield Gas & Electric Company, Springfield, Mo., recently rounded out his twenty-first year of service with that utility. The occasion was celebrated with a dinner given Mr. Hannah by A. E. Reynolds, vice-president and general manager of the utility, and a silver loving cup was presented to the honor guest also.

CARBON BLACK PLANT NEAR CASPER, WYO., TO BUILD

A company headed by B. B. Baker of Chicago will build a carbon black plant at Natrona, a few miles west of Casper, Wyo., to utilize the gas produced at Pine Mountain. Present production is estimated at 25,000,000 cubic feet of dry gas from two wells which were completed by Clyde Brennen and associates. The plant will cost about $160,000.

MARE ISLAND LOAD BUILT UP

The P. G. and E. gas line from Vallejo, Calif., into the U. S. Government Navy Yard at Mare Island has been in operation for little over a year, but during that time the load has increased rapidly until it now averages over a million feet a month. J. H. Gumz, industrial gas engineer of the P. G. and E., has been working close with Government engineers in developing new and improved processes where gas is utilized.

O. E. Phillips has been named heating and ventilating engineer for the city of Los Angeles, the first municipality to create such a position.

LITTLE DAMAGE DONE CITY PAVING BY GAS CO.

In 1926 the Los Angeles Gas and Electric Corporation gas distribution department cut 826,151 square feet of street surface, and only 5.4 per cent was of asphalt or concrete paving. The balance was of dirt, oiled or gravel street, which the Corporation justly considers a good record, indicating little damage to permanent street paving done by the company.

HUGHES B. DAVIS PROMOTED BY DOHERTY ORGANIZATION

Hughes B. Davis, who for the past three years has been connected with the public relations department, natural gas division of the The Empire Companies at Bartlesville, Okla., has been transferred to the customer ownership department of the western district, Henry L. Doherty & Company, under S. B. Ireland, Kansas City, Missouri, effective July 1. Mr. Davis will direct the activities of the many employes customer ownership campaigns under Mr. Ireland's supervision.

UNION PUBLIC SERVICE COMPANY PURCHASES GAS PROPERTIES

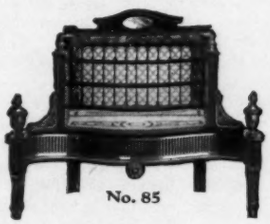
The Union Public Service Company has been given authority by the Oklahoma Corporation Commission to acquire all physical properties, franchises and assets of the following Oklahoma gas distributing companies: Beggs Gas Company at Beggs; Dewey Gas Company at Dewey; Nowata County Gas Company at Nowata, and Delaware and Tri-City Gas Company at Chelsea.

No. 112

No. 65

No. 60

No. 102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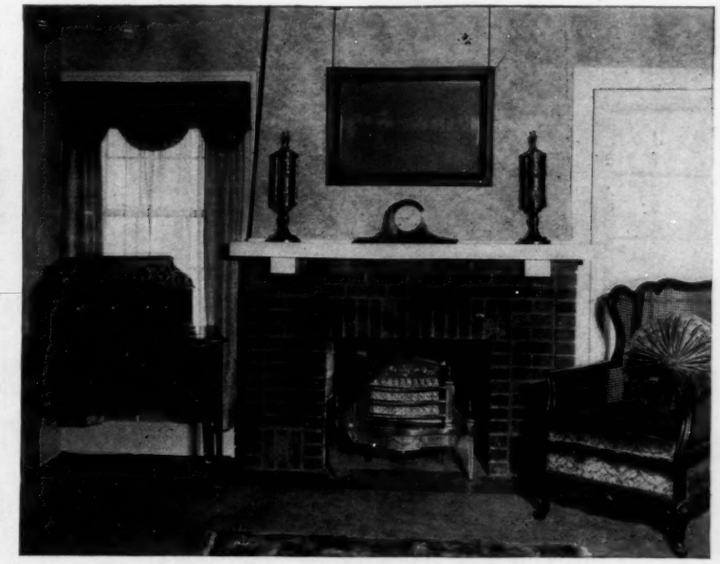


Radiantfire Model No. 90

No. 45

No. 30

No. 25

No. 115A

No. 80

Leadership

All that the word Leadership implies is concentrated in the HUMPHREY RADIANTFIRE, the pioneer in the radiant heater field,—craftsmanship, quality materials, beauty of design and efficient operation.

We are in a position to serve you from two Pacific Coast points, San Francisco and Los Angeles.

The HUMPHREY

TESTING LABORATORY AGA APPROVED

Radiantfire

TRADE MARK REG. U S PAT OFF

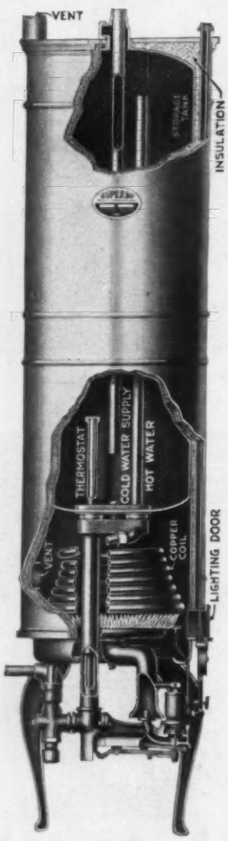
Manufactured by General Gas Light Co. Kalamazoo, Mich.

Pacific Coast Manager C. B. Babcock 135 Bluxome St., San Francisco

SUPERBO
AUTOMATIC
STORAGE
WATER HEATERS

Manufactured in Los Angeles
Since 1914

Superbo "Safety"



A Quality Product

No. 1—22 gallons...$ 97.50
No. 2—30 gallons... 125.00
No. 3—40 gallons... 150.00
No. 4—66 gallons... 250.00

FEATURING: Dual Safety Control, Detachable Heating Unit, Safety Gas Shut-off.

Prices F. O. B. Factory

Manufactured by

Superbo Mfg. Co.
Los Angeles California

HINCHEY IS OPERATING SUPT. OF GAS SERVICE COMPANY

W. J. Hinchey of the engineering department of the Gas Service Company, has been appointed operating superintendent of the company by B. C. Adams, vice-president and general manager. Mr. Hinchey will handle the details of operations of the companies in the three states—Kansas, Missouri and Oklahoma—which make up the organization. He has been handling the engineering and operating details of the properties for some time but he now bears the title of operating superintendent. He has been in the gas business for more than twenty-seven years, starting back in Pennsylvania in 1900.

NEW MAIN IN OKLAHOMA CITY

Some 5000 feet of new gas main is being laid in Oklahoma City by the Oklahoma Gas & Electric Company, to take care of additions opened up in the city this summer. Three new distribution regulator stations are also being erected in the city.

TO MAKE POTTER PRODUCT

The Magic Way Company, National City, Calif., has taken over manufacturing operations of the Potter Radiator Corporation, of that city, with G. W. Anderson as general manager.

28 MILLION TO UTILITY ADS

Frank LeRoy Blanchard, retiring president of the Public Utilities Advertising Association, estimated before the 1927 meeting of that organization that public utilities would spend $28,000,000 on advertising this year. The sum expended for advertising by utilities has practically doubled since 1922.

LONE STAR SHIPPING PIPE TO PAUL'S VALLEY

The Lone Star Gas Company, which has taken over the gas franchise recently voted by Pauls Valley to Walter H. Gant, is shipping pipe and machinery, and will soon have a full crew of men at work constructing a gas distribution system in Pauls Valley.

GAS-HEATED OAKTITE TANK

The Multnomah County, Oregon, road department has installed a large gas-heated Oaktite tank for cleaning parts of country trucks that come in for repairs.

STAVELY EXTENSION STARTED

It was announced recently that the Canadian Western Gas Light Heat and Power Company of Calgary will soon supply natural gas to the town of Stavely. This extension involves laying a 2-mile pipe line to connect with the main high pressure line and the local distributing system at Stavely. The work is now under way.

W. A. JONES MOVES UP IN H. L. DOHERTY ORGANIZATION

William Alton Jones, for the last two years chairman of the Executive Committee of Henry L. Doherty & Company, has been elected first vice-president of Cities Service Company. Mr. Jones has been with the Cities Service organization since 1912. Until he came to New York in 1921 he was at Joplin, Mo., where he served as treasurer of the Empire District Electric Company and associated companies. Mr. Jones is an officer or director of some 50 companies, among which are Cities Service Power & Light Company, Empire Gas & Fuel Company, Ohio Public Service Company, Crew Levick Company, Gas Service Company and Toledo Edison Company.

GEO. L. MYERS CHAIRMAN PUBLIC RELATIONS COMMITTEE

Geo L. Myers, assistant to the president of Pacific Power & Light Company, has been appointed chairman of the executive committee of the Public Relations Section, Northwest Electric Light and Power Association for the Association year 1927-1928. Electrical power, electrical manufacturing and electrical jobber interests are comprised in the Association, territory covered including the states of Idaho, Montana, Oregon, Washington, Utah and the Territory of Alaska. Mr. Myers served as chairman of the same committee for the year 1922-1923, and was president of the Association in 1923-1924.

Geo. L. Myers

ROSEVILLE SERVICE STARTS

With the completion of the Sacramento to Roseville line, and with over 1200 new consumers ready for gas service, the P. G. and E. extended its activities into that Northern California community officially on July 20. The Sacramento-Roseville line is about 18 miles in length, of six-inch welded steel, constructed at a cost of about $225,000. It passes through the towns of Antelope and South Roseville, where additional consumers have been added to the system. In South Roseville a particularly attractive industrial gas load has been acquired in serving the Pacific Fruit Express, which has just moved its plant for the repairing and servicing of refrigerator cars to that town.

EVERLASTING PAINT AND SALES CO. HAS NEW OFFICES

The Everlasting Paint and Sales Company announce the removal of their general offices in Los Angeles to 1110 Board of Trade Building. Increased manufacturing facilities have also been provided for the McRae Paint Products, Inc., formerly located in Van Nuys, Calif., by their recently established location at 5501 S. Boyle Avenue, in the Vernon manufacturing district, Los Angeles.

According to A. M. Shenk, president of the Sales Company, a consolidation of offices has been made with the Morris Engineering Company, holders of the California rights to the "Hunt process" of curing concrete, which will greatly increase efficiency in the operations of these organizations and give better coordination in the distribbution and application of "McEverlast" products.

GAS PIONEER DIES

Allen L. Parker, one of the oldest employees of the Empire Natural Gas Company, died at his home at Petrolia, Kansas, Sunday, July 3. Mr. Parker went to work for this company on Augusa 9, 1905, and at the time of his death lacked but a little more than a month of having been in the continuous service of the utility for 22 years.

HUGO SIGNING FOR GAS

Hugo, Oklahoma, in Choctaw county, hopes to become a natural gas town during the next few months. A campaign for signatures to contracts to use gas if it is made available is now well under way, according to reports.

ANNOUNCING

the ROPER

Sheetflame

RADIANT HEATER

(FORMERLY KENNEDY)

A new force in Roper's program of "Greater Service to the Gas Industry"

Again Roper enlarges its service to the Gas Industry —with a radiant gas heater of proven merit and nation-wide recognition.

The Roper Sheetflame Radiant Heater (formerly Kennedy) is now being manufactured in the Roper plant — backed by the same great resources, facilities and merchandising experience which support Roper Gas Ranges and Roper Gas Fired Warm Air Furnaces.

Today the Roper Sheetflame is giving heating satisfaction in many thousands of homes. It is the only radiant heater with a "solid sheet of flame." It is artistic, simple in operation, durable and safe, having passed the A.G.A. Laboratory. In sizes, designs, and prices it covers the needs and tastes of every class of buyers.

With the radiant gas heater business on a steady, rapid increase — with the Roper organization back of this quality product—the Roper Sheetflame Radiant Heater offers exceptional opportunities for large and growing sales of heaters and of gas. Write for complete information.

GEO. D. ROPER CORPORATION, Rockford, Ill.

ROPER

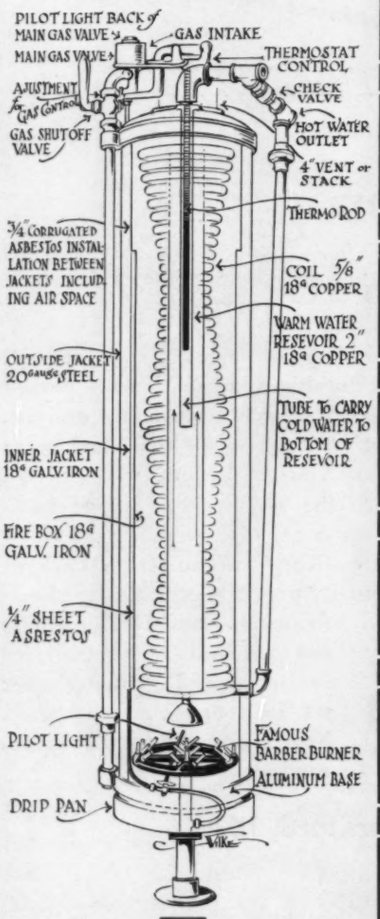
Sheetflame RADIANT HEATERS

THE SOLID SHEET THROWS OUT MORE HEAT

IT IS DIFFERENT
IT STARTS HOT

There Are No
"Bugs"
in the
New Way
WATER HEATER

DIAGRAM VIEW of HEATER CONSTRUCTION


PILOT LIGHT BACK of MAIN GAS VALVE
GAS INTAKE
MAIN GAS VALVE
THERMOSTAT CONTROL
ADJUSTMENT for GAS CONTROL
CHECK VALVE
GAS SHUT OFF VALVE
HOT WATER OUTLET
4" VENT or STACK
THERMO ROD
¾" CORRUGATED ASBESTOS INSTALLATION BETWEEN JACKETS INCLUDING AIR SPACE
COIL ⅝" 18g COPPER
WARM WATER RESEVOIR 2" 18g COPPER
OUTSIDE JACKET 20 GAUGE STEEL
TUBE TO CARRY COLD WATER TO BOTTOM OF RESEVOIR
INNER JACKET 18g GALV. IRON
FIRE BOX 18g GALV. IRON
¼" SHEET ASBESTOS
PILOT LIGHT
FAMOUS BARBER BURNER
ALUMINUM BASE
DRIP PAN

The pilot light circulates warm water through the coils and container at all times—no waste of gas, time or water.

Entirely thermostatically controlled.

Made and Guaranteed by

New Way Manufacturing Company, Inc.

894 FOLSOM STREET
SAN FRANCISCO

COAST COUNTIES LINE NEARS COMPLETION

The new 21-mile high pressure gas line of the Coast Counties Gas and Electric Company nears completion. At the present time the 6-inch welded steel main has been pushed along over half the distance from Santa Cruz to Watsonville, the two Northern California towns that are to be tied together. The countryside through which the new service will pass is rich in gas sales possibilities, the line running along the main highway and through popular and growing sections—Aptos, Capitola and Soquel. As the line is completed the plant capacity at Santa Cruz will be increased until eventually it will be sufficient to supply all of the demand for the entire territory. At that time, the Watsonville plant will probably be discontinued entirely.

FORT WORTH OPERATOR BUILDS GASOLINE PLANT

Hirt & McDermott Company of Fort Worth, Texas, is building an absorption natural gasoline plant with an estimated capacity of 6,000,000 cubic feet of gas daily, on the Dyer farm 14 miles west of Cisco, Texas. The gasoline plant is being built by the above firm for the Moody Corporation of Fort Worth.

HOUSTON LINE TO SUPPLY CARTHAGE, EN ROUTE

The Dixie Pipe Line Company's new 22-inch gas pipe line extending from Waskom and North Louisiana fields to Houston, Texas, will pass within three miles of the town of Carthage, Texas, and this city recently voted a franchise to the gas company for local distribution of gas for fuel. The gas company has requested the Chamber of Commerce to make a survey of the number of people in Carthage that want natural gas. Dixie's line is the third gas line which has been built in Paola county, the Magnolia company having two gas lines already supplying Texas cities from Latex.

SCIENTIFIC MANAGEMENT MEET CALLED FOR ROME, ITALY

The Third International Congress on Scientific Management will convene in Rome, Italy, on Monday, Sept. 5, and American engineers and industrial leaders are offered a cordial invitation to attend. One of the four general subjects for consideration is that of scientific organization of labor for public services.

INTRODUCE NEW LINE

Warren Webster & Company, Camden, N. J., has brought out a new line of products, Webster Series 38 thermostatic traps for "process steam" pressures.

NEW BUSINESS MEN ACTIVE IN PORTLAND

Two gas ranges of modern type have gone into the new Swedish Baptist Church kitchen in Portland, Ore. The new business department of the Portland Gas & Coke Company has also installed a nine-pan Gasco oven in a bakery opened by Frank Rogers at 1013 Union Avenue, North, in Portland.

OPTIONAL HEATING RATE

Permission has been given the Joplin Gas Company, Joplin, Mo., by the Missouri Public Service Commission to apply an optional gas heating rate. The rate will be used only at the discretion of the customer, who may return to the flat rate if desired.

ANOTHER ADVANCE FOR FORMER PACIFIC COAST GAS MAN

George E. Whitwell, formerly with the Tacoma Gas and Fuel Company, and still a member of the Pacific Coast Gas Association, has been appointed general sales manager of the newly formed general sales department of the Duquesne Light Company, Equitable Gas Company, and Equitable Sales Company, all of which are subsidiaries of the Philadelphia Company, Pittsburgh, Pa. Mr. Whitwell, before taking the new post, was general manager of the Equitable Gas Company, and served as manager of the gas department of the Byllesby Engineering and Management Corporation before that.

SELL DIRECT IN LODI

As the initial step in its policy of selling gas appliances direct in the Lodi, Calif., territory, the Pacific Gas and Electric Company inaugurated its campaign in that section with a three-day demonstration featuring modern gas ranges and automatic water heaters. A cooking school was conducted by Miss F. Bull, and a total attendance of 520 was reported for the three days. Immediately following the demonstration a crew was sent out on an intensive house-to-house sales campaign for automatic water heaters.

LOWER INDUSTRIAL RATES

Effective August 1, the Little Rock Gas and Fuel Company of Little Rock, Arkansas, voluntarily reduced rates on industrial gas, in an effort to interest new industry in the community.

"FUMES AND FLASHES" IS DISCONTINUED

"Fumes and Flashes," company house organ of the Western States Gas and Electric Company, has been discontinued as a result of the acquisition of the Western States utility by the Pacific Gas and Electric Company. T. J. Janes was editor of "Fumes and Flashes."

PAYETTE GAS FRANCHISE

Payette, Idaho, granted the Idaho Petroleum Company a gas franchise early in July, with 18 months allowed to complete installation of services. Gas is to come from a natural gas well near the community.

WATER SPRAYS INSTALLED

The Puget Sound Power & Light Company, Bellingham, Washington, has installed water sprays in the top of the superheater of the new Steere water gas set installed last year.

CONCORDIA GAS CO. TO GREAT LAKES UTILITIES HANDS

Great Lakes Utilities Company of New York is understood to have purchased the Concordia Gas Company, Concordia, Kansas. The company was sold to the Central Utilities Company of Des Moines, Iowa, just prior to its purchase by the New York company.

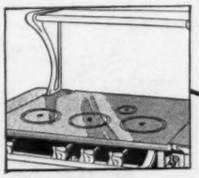
NEW SERVICES ADDED

Some 300 new services have been connected to the lines of the British Columbia Electric Railway gas department by the new high pressure eight-mile line for Kingsway to the Victoria road and South Hill districts.

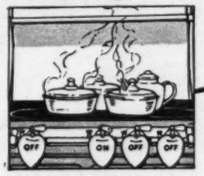
KNOLLMAN ON OHIO VISIT

H. J Knollman, formerly ceramics engineer for the Los Angeles Gas and Electric Corporation, left the Coast on August 1 for a visit in Columbus, Ohio.

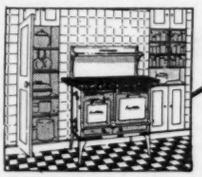
4000 Women Called to see SMOOTHTOP!



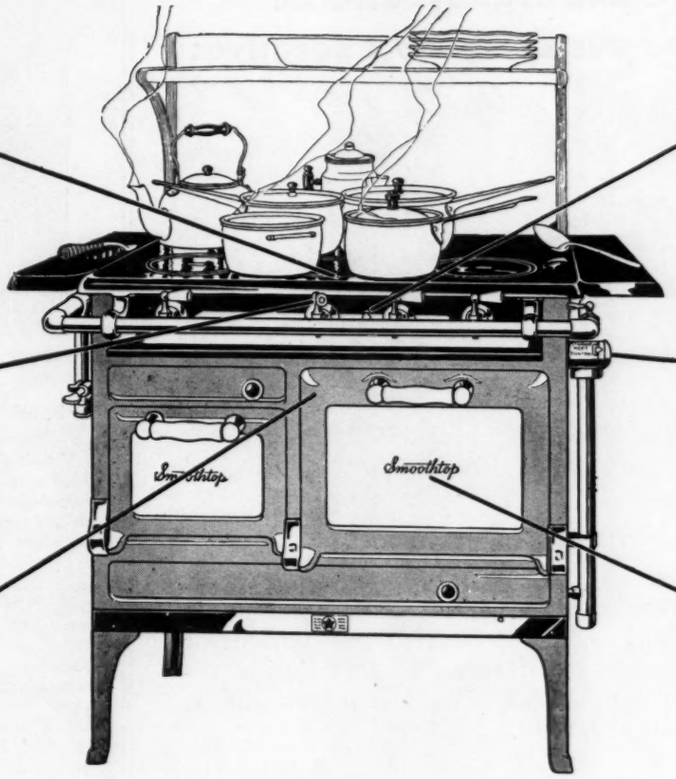
Convenient, broad, smooth, enclosed top, holds 6 or 7 vessels. Vessels can be moved without lifting.

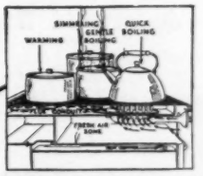


An entire dinner can be cooked over one burner, and then kept hot until served.

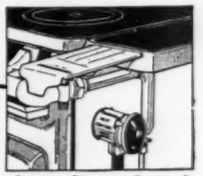


Beautiful, it improves the appearance of any kitchen. Its compactness saves space.

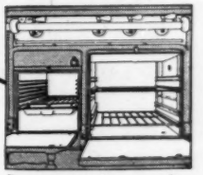




Four heat zones—quick boiling, gentle boiling, simmering and warming, all from one burner!



Oven Heat Control enables you to cook without watching. Let the Smoothtop cook while you're away.



Large capacity, evenly heated oven, that akes perfectly, and the newest type of broiler.

YES, when over 4,000 women take the trouble to call to see a Smoothtop demonstration, ask for a Smoothtop cookbook, and give their names, it's pretty good evidence that women are interested in Smoothtop. And this in a single city, in one month, where Smoothtop had never been sold before. A large number of Smoothtops were sold and there has been a continuous demand ever since.

We continually surprise new and old customers by demonstrating the ability of Smoothtops and our localized merchandising plans to produce a large volume of sales. Perhaps we can do the same for you.

Northwest Gas & Electric Equipment Co.

Pacific Coast Distributors,
Standard Gas Equipment Corporation

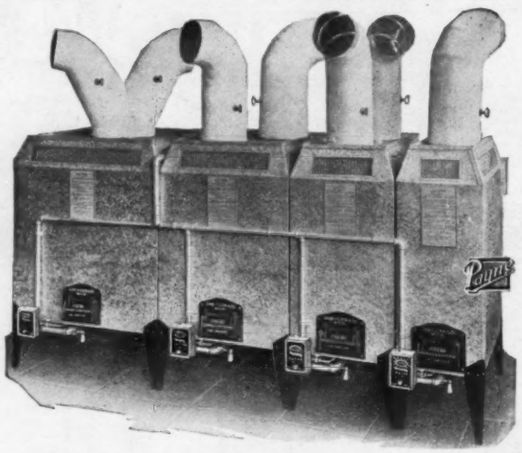
372 Pittock Block,
Portland, Oregon.

180 New Montgomery St.,
San Francisco, Calif.

164 So. Central Ave.
Los Angeles, Calif.

Why the Unit system of gas heating reduces gas consumption

A Short Talk to Gas Company Executives



THE UNIT SYSTEM provides several individual heating units instead of one large central furnace. Each unit is a separate heating plant. It furnishes a separate and independent source of heat for each room or natural group of rooms. This plan of installation reduces fuel consumption to actual requirements and is adaptable to all types of homes.

PAYNE FURNACE & SUPPLY CO. INC.

Main Office, 338 Foothill Road, Beverly Hills, Calif.
Branch, 2247 Grove St., Oakland, Calif.
Branch: 115 E. Union St., Pasadena, Calif.
Branch: 478 Sutter St., San Francisco, Calif.

Smith-Emery Co.

Chemists—Engineers

Established 1910

Analyses and tests.
Represent Pittsburgh Testing Laboratory
for inspection at Eastern foundries, mills and shops

Offices & Laboratories

245 So. Los Angeles St., Los Angeles
651 Howard St., San Francisco

F. W. Steere

F. W. STEERE NAMED HEAD OF MICHIGAN GAS ASSN.

Frank W. Steere, of New York, vice-president and general manager of the Semet-Solvay Engineering Corporation, was elected president of the Michigan Gas Association for the coming year at the annual convention of the association, held at Mackinac Island, Mich., early in July.

R. H. Lawlor, of Jackson, general superintendent of the gas department of Consumers Power Company, was chosen for vice-president, and Albert G. Schroeder, secretary of the Grand Rapids Gas Light Company, was re-elected secretary-treasurer.

Mr. Steere's election marks the first time in the history of the organization that a citizen of another state has been made president. A graduate of the University of Michigan, where he held the fellowship of the Michigan Gas Association, he was president of the Steere Engineering Company, Detroit, from 1914 to January, 1927, when the Semet-Solvay Engineering Corporation, New York, was formed. He is an outstanding figure in the gas industry, having developed and perfected many processes in the production of manufactured gas.

MIDWEST GAS BUYS TWO

Two gas companies valued at about $90,000 were purchased recently by S. M. Williams, president and general manager of the Midwest Gas Company, of Tulsa. The Western Power and Gas Company, and the Sayre Gas Company, both operating in Beckham County, Okla., were taken over by the Midwest Company.

NEW COMPANY ORGAN

The "Gasco Tab" has begun publication as the official organ of the Fort Worth Gas Company, Fort Worth, Texas. Garfield Crawford, head of the company's publicity department, is editor.

HOLDER INCREASES PRESSURE

A fifty per cent increase in gas pressure has been effected at Columbia, Mo., through completion of a 150,000 cu. ft. gas holder, according to C. S. Cleveland, manager of the Missouri Utilities Company, which serves the community.

PRETTIER HAIR
and nine other reasons

THE joy of being at your best at all times is one of the chief pleasures of life as we live it. The exhilaration that comes from the knowledge that you "looked the part" on the right occasion is alone worth the price of a Hotzone.

Hotzone furnishes the hot water that makes all soaps and shampoos deliver the service you paid for. It makes all beauty aids more effective. It delivers health and meets emergencies.

And for all this its cost is but a fraction of what you pay out year after year to buy the other incomplete services. In fact, the Hotzone Self-Action Water Heater costs so little that it can be purchased today for five dollars down and small monthly payments. Don't miss this opportunity—buy and save.

for better complexions
for prettier hair
for softer hands
for greater health
for cleaner clothes
for easier shaving
for less work
for economy
for more leisure
for all emergencies

$5.00 down

Dealer's Name and Address Here

HOTZONE
SELF-ACTION GAS WATER HEATER

ONE of a series of copyrighted newspaper advertisements which is now being offered to gas companies selling the Hotzone.

Part of the series is based on the appeal that the Hotzone supplies the essential hot water which makes effective the $1,825,000 worth of beauty aids purchased annually.

For full particulars, including a set of proofs, write Welsbach Company, 863-865 Mission Street, San Francisco.

The Hotzone is made in four sizes Fifteen, Twenty, Thirty and Forty-Five gallons.

WELSBACH

Strikes keynote of water heater sales in new advertising appeal · *Send for details*

It's good for what ails sales

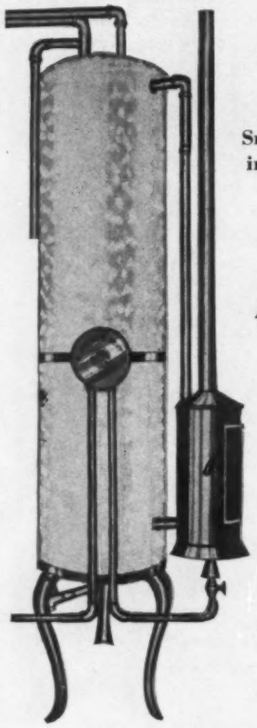
Member American Gas Association—Member Pacific Coast Gas Association—Member Natural Gas Association

Snap-O-StaT

Positive hot water control

An abundance of hot water at the turn of the faucet. The SNAP-O-STAT makes possible a constant supply of hot water day or night. The tank is always filled with water stored and heated for immediate use.

For use on any storage water heater.



Showing **Snap-O-staT installation on Range Boiler with Heater Attached**

Gas Appliance Dealers Attention!!

We want dealers in every city and town throughout the United States. Write today for our agency proposition.

Shaffer-Welch Sales Corporation

354 S. Spring St., Los Angeles, Cal.
EXCLUSIVE UNITED STATES SALES MANAGERS

NATURAL GAS GASOLINE OPERATIONS

Compiled by E. T. Knudsen

Department of Commerce, Bureau of Mines, Division of Mineral Resources and Statistics

ONE hundred and forty-seven natural gas gasoline plants with a daily indicated capacity of 1,440,700 Thousand Cubic Feet, report a recovery of 39,371,684 gallons of natural gas gasoline from 26,882,024 thousand cubic feet of gas treated in June. This is a decrease of 220 barrels in Daily Average Production.

Utilization of natural-gas gasoline amounted to 940,428 barrels, a decrease under May of 32,908 barrels. Daily average utilization of 31,348 barrels was 101 barrels more than Daily Average Production of 31,247 barrels.

Stocks of natural-gas gasoline at the end of May amounted to 608,542 barrels of which 28,796 barrels were reported by natural-gas gasoline plant operators and 579,746 barrels by refinery operators. This is a decrease of 3,007 barrels under May stocks. This stock figure of 608,542 barrels is approximately nineteen and one half days supply at the current rate of consumption.

Production of gasoline during the month of June amounted to 4,731,789 barrels, a daily average of 157,726 barrels. This is a decrease in total production of 132,444 barrels or 2.72 per cent under May output and an increase of 879,343 barrels or 22.83 per cent over the output of June 1926.

Of the total gasoline produced 19,420 barrels were reported as finished gasoline produced by natural-gas gasoline plant operators. Production of gasoline from Cracking Processes decreased in June to 197,052 barrels.

Stocks of gasoline show a decrease of 117,053 barrels during June and at the end of the month amounted to 12,204,716 barrels. This stock figure includes 30 barrels of finished gasoline reported by natural-gas gasoline plant operators.

CALIFORNIA NATURAL GAS GASOLINE PRODUCTION, DISTRIBUTION AND STOCKS

June, 1927

PRODUCTION *Type of Plant*	*Gas Treated M.C.F.*	*Natural-Gas Gasoline Produced Gallons*	*Gasoline Recovery Per MCF Gas Treated*
Oil Absorption	12,453,435	19,015,541	1.527 Gal.
Compressor	242,393	366,529	1.512 "
Combination Comp. and Oil Absorption	9,464,263	14,799,794	1.564 "
Combination Oil and Charcoal Absorption	4,053,055	5,142,662	1.269 "
Charcoal Absorption	668,878	45,064	.067 "
Drip	.....	2,094	..... "
TOTALS	26,882,024	39,371,684	1.465 "
Finished Gasoline produced at plants			19,420 Bbls.

DISTRIBUTION STOCKS			
Stocks First of Month	..... Bbls.		611,549 Bbls.
Production during Month	..... "		937,421 "
Quantity Mixed with crude or Unfinished Oils	325,295 "		
Used in Blending at Refineries	466,108 "		
Stocks end of Month	608,542 "		
Used at Plants, Shortage and Evaporation losses	18,147 "		
Balance	130,878 "		
	1,548,970 "		1,548,970 "
Natural-gas Gasoline held by Natural-gas Gasoline Plant Operators	1,209,429 Gal.	or	28,796 Bbls.
Natural-Gas Gasoline held by Refiners	24,349,332 " "		579,746 "
TOTALS	25,558,761 " "		608,542 "
Finished Gasoline (Motor Fuel) held by Natural-Gas Gasoline Plant Operators			30 Bbls.

SIGNAL GASOLINE OPENS MID-CONTINENT OFFICE

The Signal Gasoline Company with headquarters in Los Angeles, has opened a Mid-Continent Branch office in Tulsa, Okla., in the Exchange National Bank Bldg. Ray R. Rosier, formerly sales manager for the Akin Gasoline Company at Tulsa, is in charge of the new office of the Signal Company. Mr. Rosier was with the Akin Company for the past three years. Prior to that connection he was sales manager for the Western Oil Corporation. In his new position he will handle the sales for three natural gasoline plants of the Signal Company in the mid-continent field.

UNION STARTS OPERATION OF RICHFIELD COMPRESSOR PLANT

Union Oil Company has put into operation its new Richfield compressor station, replacing the original compressor plant at the company's Richfield absorption plant. Four 320-H.P. and one 640-H.P. horizontal twin gas driven compressors with a total capacity of 14,000,000 cubic feet per 24 hours went into the installation. The plant is piped to operate either on wet or dry gas. One purpose of its erection was to provide more gas to operate the company's enlarged gas lift system.

MAGNOLIA GAS COMPRESSOR

Magnolia Gas Company has under construction a large gas compressor, three miles west of Mineola, Okla.

REGAUGE MONROE GAS FIELD

Work has started on requaging the gas in the Monroe natural gas field, which is comprised of Morehouse, Ouchita, and Union Parishes, under the supervision of the Louisiana Department of Conservation. This great gas reservoir is gauged every six months, the work usually requiring about 60 days.

JEWEL STOVES AND FURNACES
DETROIT STOVE WORKS
LARGEST STOVE PLANT IN THE WORLD

JEWETT

MAGEE

Monarch MALLEABLE

YORK ABENDROTH

ERIEZ

STOVES SUMMIT RANGES FURNACES
COMBINATION COAL AND GAS RANGES

PEERLESS

T TAPPAN

SPARK

RED CROSS RANGES & FURNACES

Crawford Gas Ranges

ANDES

Paramount MALLEABLE

THERE are 3 outstanding features in the Wilcolator Oven Heat Control that recommend it strongly to the retailer in gas ranges and commercial representatives of gas utility corporations. These are:

1. Wilcolator equipped ranges give more value per dollar of price.
2. Wilcolator equipped ranges increase the consumption of gas through greater use.
3. Wilcolator equipped ranges will stimulate replacement business.

Send requests for more specific data to Dept. 4 at the address below. No obligation is involved.

THE WILCOLATOR COMPANY

17-23 Nevada Street **Newark, N. J.**

WILCOLATOR

OVEN HEAT CONTROL

The
TRANSFORMATION

Lean oil becomes fat oil; wet gas becomes dry gas —a simple process that results in thorough extraction of gasoline—by the Campbell method.

A Catalog will be forwarded upon request

J. A. Campbell

Consulting—Designing—Constructing
Natural Gas Engineer

P. O. Box 669 Long Beach, Calif.

CAMPBELL
OIL FROTH
absorber

The STRICKLER
Ratchet Pipe Cutter

The STRICKLER Ratchet Pipe Cutter automatically cuts cast iron, steel and wrought iron pipe (from 1½ to 30" in diameter) by hand (either in the trench or in the shop).

You can cut any pipe from any position easily. Simply pump the handle and the STRICKLER does the rest. Order your STRICKLER Now

W. W. STRICKLER & BROS.
1475 Oak Street Columbus, Ohio

BIG OUTPUT OF NATURAL GASOLINE IN OKLAHOMA

Natural gasoline plants in Oklahoma now have a combined daily capacity of approximately 2,300,000 gallons, placing this state well in the lead among natural gasoline producers.

HELIUM PLANT OPERATING

The helium plant erected by the Kentucky Hydrogen & Oxygen Company near Dexter, Kansas, began operation in July. Dexter gas runs as high as two per cent helium, said to be the richest in the country. The Kentucky operators' investment in the helium plant will amount to about $1,000,000 when other units planned are added.

GASOLINE PLANT AT OXFORD, KANSAS, FOR ROXANA

The Roxana Petroleum Company has under construction a new absorption natural gasoline plant at Oxford, Kansas, which will have a capacity of 4,000,000 cubic feet of gas daily, and so constructed that this capacity may be doubled when desired. Oxford is the scene of a new oil and gas development boom. Roxana completed and started operating its new gasoline plant in the Bowlegs pool of the Greater Seminole area during the past month.

STANDARD GASOLINE ENTERS COMPANY SAFETY MEET

The Standard Gasoline Company will enter two teams in a safety contest conducted by the Standard Oil Company of California in its first aid contest and picnic at Brookside Park, Pasadena, Calif., on Admission Day. This is the fourth of such annual contests Standard Oil of California has held, and this year there will be eight teams included, representing producing, pipe line, refinery departments, and Standard Gasoline Company.

MOTOR FUEL EXPERT TO CALIF.

Dr. G. G. Brown, of Michigan University, who has conducted a research on natural gasoline in motor fuels for the Association of Natural Gasoline Manufacturers, is expected to be in Los Angeles in September or October to appear on a program being held jointly by the above association and the California Natural Gasoline Association.

GILMORE CO. PLANS THREE MORE PLANTS AT SEMINOLE

The Forrest E. Gilmore Co., Tulsa, is installing three small gasoline plants of the absorption type in the Bowlegs section of the Seminole field. The Gilmore Company recently completed an absorption gasoline plant at Wetumka, Okla., which is handling 10,000,000 cubic feet of gas daily. The plant production is approximately 3,000 gallons of gasoline daily. It is planned to enlarge the capacity and daily production to about 7,000 gallons daily soon.

GETS SEVERY FRANCHISE

Spencer Van Devanter of Severy, Okla., has been given a franchise to operate a gas utility in that community.

ACCIDENT ELIMINATION

Safe Practices Pamphlet No. P. U. 1, just published by the National Safety Council, 108 E. Ohio Street, Chicago, Ill., contains suggestions for elimination of accident to the public on part of utilities, the classes of utilities covered being electric light and power, gas, telephone and telegraph, and water.

Be Unbiased!

With Pacific's complete line in your store, you need never be charged with special pleading. When customers know you have *all types* of Gas Heating Appliances, they will realize that your only interest is to give them such a degree of satisfaction that they will some day come back for more.

Pacific Gas Radiator

Gas Heating Company Headquarters

Roseberry and Walter Streets, Huntington Park, California

Los Angeles Agency
Pacific Gas Heating Company
1732-40 W. Washington St.
BEacon 2190

Gas-Steam Radiators

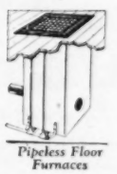
Unit Basement Furnace Systems

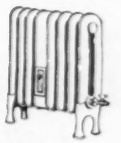
Dual Pipeless Furnaces

Fireplace Radiant Heaters

Recess Radiant Wall Heaters

Automatic Storage Hot Water Heaters


Pipeless Floor Furnaces


Gas Radiators—Pressed Metal and Cast Iron

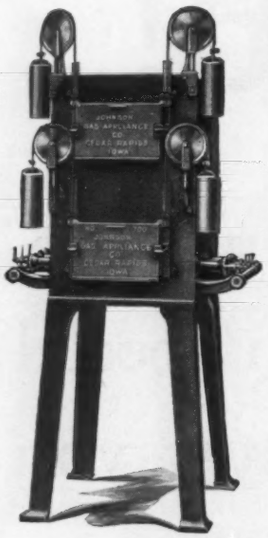
Agencies Throughout the West

DISPLAY AT METROPOLITAN BUILDING MATERIAL EXHIBIT

Call for a Pacific Heating Engineer

MANUFACTURERS *of* EVERY TYPE *of* GAS HEATING APPLIANCE

All Vented for Healthful Heat



JOHNSON

Double Deck Oven Furnace

The Johnson No. 700 Double Deck Oven Furnace is designed for carbonizing, hardening, annealling, etc. It has a pre-heating oven on top, whose dimensions are the same as those of the lower oven. Doubly lined with fire-brick. A temperature of 2150 degrees is attainable in the lower oven and 1500 degrees F. in the pre-heating oven without the use of a forced air blast. Write for details.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. Babcock Co.
135 Bluxome Streeet San Francisco, California

"Beacon"

Automatic Storage Water Heaters

Made in Four Models.
Several sizes in each model.

Hundreds of "BEACONS" in constant use in Pacific Coast Cities have been giving efficient service for years.

DEALERS

The "Beacon" is easy to sell because of its many exclusive features.

Descriptive circular upon application.

Beacon Water Heater Co.
GEORGE F. PEARSE
776 South San Pedro Street
Los Angeles

Master Meters *in* Denver

(Continued from Page 28)

penses, and meter setting and removing.

Higher standards of illumination and domestic gas utilization which result from "free gas and electricity" encourage other consumers in a community to more liberal utilization.

Better public relations ensue when all of the petty negotiations over credit ratings, meter readings, and collections are eliminated, and when these consumers realize that the company is granting the landlord such low wholesale rates as to make possible "free gas and electricity."

Builders of future apartment houses can be encouraged through such successful examples to save approximately $5000 of extra costs for piping and wiring each apartment for an individual meter. The sum thus saved can be diverted to the purchase of equipment such as gas-fired water heating boilers, house heating equipment, refrigerators, etc.

WANTS ARNETT FRANCHISE

C. E. Burlingame of Bartlesville, Okla., has asked a franchise to serve Arnett, Okla., with natural gas.

DRY PIPE MOULDS BY GAS

The Oswego Pipe Company, Portland, Ore., have begun to use gas for drying their pipe moulds. These are dried in place, preventing much breakage that formerly took place while moving the moulds to the dryer. Faster production and an improved product are also resulting from the use of gas.

RECOMMEND TO RE-ELECT A. G. A. COMMERCIAL SECTION HEADS

The nominating committee of the Commercial Section of the American Gas Association has made its report to the Managing Director, Alexander Forward, unanimously recommending the continuation of the present officers for the coming year, as follows:

For chairman—J. J. Burns, The Laclede Gas Light Co., St. Louis, Mo.

For vice-chairman—G. M. Karshner, Consolidated Gas Co. of New York, New York.

HOLLIS GASOLINE PLANT IS NOW AT WORK

The Lone Star Gas Company has placed in operation its new combination absorption and compression type natural gasoline plant at Hollis, Okla. The plant has a daily production of 4,000 gallons. Gas for the plant is being supplied from the Lone Star's new 18-inch pipe line from Wheeler County, in the Texas Panhandle, which connects with the company's main system at Petrolia, Texas. R. F. Foster is the engineer in charge of the new installation.

"GAS HEATROLA" NEW ESTATE CONTRIBUTION

In line with the increasing interest that is being shown by gas utilities and the public generally in house heating by gas, the Estate Stove Company of Hamilton, Ohio, has brought out something decidedly different in the heating line. The "Gas Heatrola," as the new line is trade-named, is a cabinet heater, finished in vitreous enamel to resemble natural wood. It is equipped with the patented Intensi-Fire Air Duct, the basis of its double air-circulating system. The new unit is fume-tight, and a vapor tank moistens the heated air. It is advertised for complete heating of small homes on manufactured or natural gas. Specifications are: Catalog No. 100; height over all 42½ inches; width over all 23½ inches; depth over all 17 inches; shipping weight 250 pounds; rated capacity 50,000 B.t.u. per hour.

COAST COUNTIES MOVING UP

Within a few weeks the Coast Counties Gas and Electric Company will move into its new quarters in the Russ building, San Francisco's newest and biggest office structure. The utility organization will share with the North American Investment Corp. the entire twenty-fifth floor. S. Waldo Coleman, president of the Russ Building Corp., and the North American Investment Corp., is well known to the gas industry as president of the Coast Counties Gas and Electric Company.

26 DAYS TO COMPLETION IS BOLSA CHICA PLANT RECORD

J. A. Campbell of Long Beach, Calif., in July completed a 15,000-gallon standard 30 pound absorption plant for the Bolsa Chica Oil Company at Ventura, Calif. The plant, which is now making 4,800 gallons a day from two wells, was erected and put in operation in a period of 26 days, believed to constitute a record for gasoline plant erection.

W. W. ZIEGLER VISITS COAST

W. W. Ziegler, sales manager of the Cleveland Heater Co., has just returned East from his first visit to the Pacific Coast. He stopped first in Los Angeles, thence to San Francisco, where he spent several days with T. G. Arrowsmith, the Pacific Coast distributor for the Rex heater, the Cleveland company's trade-named product.

Plant Inspection

(Continued from Page 37)

Each plant is provided with a board upon which to display the trophies won. This board is so designed that the premium plate is set in the center and the smaller trophies are placed about this as a border.

The general principle behind the inspection system is, of course, to provide efficient operation, and in addition, it is desired to have a neat and orderly appearance about all of the properties.

It has been long recognized that to repair the small troubles prevents large ones, and as a result the work of the plant crews is much reduced. It has also been recognized that orderly surroundings make happier and more contented workmen. The idea is that of good housekeeping carried from the home into the plant, with a consequent widening of the area of contentment.

EMPIRE PURCHASES BIG TEXAS GAS RESERVE

What is probably one of the largest deals for natural gas reserve acreage ever contracted in one transaction was made by the Empire Companies, Bartlesville, Oklahoma, when this company took a gas lease on 63,880 acres of the Burnett Ranch, 6666, in the Texas Panhandle, in July. This acquisition, together with the purchase of natural gas rights in two smaller adjoining tracts, upon which producing wells are already located gives an assurance of a gas supply for their Amarillo line for many years to come.

The terms of this purchase contract provide for control of all natural gas production on this acreage for a period of 10 years or as long as they shall produce and market gas from same. It also provides for paying a $50,000 annual royalty, and, if actual royalties shall be in excess of this amount, for making up the difference. Ten wells will be started immediately on this tract by the Empire Companies.

NORTHWEST LA. GAS CO. BUYS RUSTON GAS COMPANY

Belchic and Laskey (The Northwest Louisiana Gas Company) have recently purchased the Ruston Gas Company from J. M. Thatcher, Jr. and associates. The purchase includes a six-inch pipe line from the Monroe gas field built a couple of years ago. Northwest Louisiana Gas Company is now building a similar line from Homer to Arcadia, which is to be extended to Ruston where it will feed into the local distributing system supplied from Monroe. The Northwest Louisiana Gas Company now has franchises in eleven communities and franchises in ten more towns are reported in prospect. The purchase of the Ruston company causes the Monroe and the Webster gas fields to be connected together for the first time.

SOUTHWEST TEXAS SHOWS BIG GAS COMPLETION RECORD

Eighty-two gas well completions were made in southwest Texas in the first six months of 1927, as compared with sixty for the north central counties, thirty for the Panhandle, and thirteen for the rest of the state. Volume of wells completed in southwest Texas in this period has been estimated at close to 3,000,000,000 cubic feet.

RE-RUBBER LINE JOINTS

Kansas Natural Gas Company has two 50-man crews at work re-rubbering joints in its line across the state.

Worthy of *your* consideration

Is the matter of preserving and beautifying your storage tanks, pipes and equipment—in fact, every metal appurtenance is worth many times the small cost of applying a protective coating.

"McEVERLAST"
Protective Coatings

Our "LUMINITE" No. 1001 is being used extensively on metal storage reservoirs and tanks. It is a beautiful bright silver and durable; has a remarkable "coverage" and is known to materially reduce evaporation. Its ECONOMY is another big factor for consideration.

"McEVERLAST" No. 99, Non-Corrosive Coating is unexcelled for the preservation and waterproofing of tank covers, metal roofs, etc. It is practically everlasting, and the cost of application is reasonable.

Our line is "full protection" for all industrial materials.

EVERLASTING PAINT AND SALES COMPANY
1110 Board of Trade Bldg.
Los Angeles

ALUNDUM—CRYSTOLON
Heavy Duty Refractories
For All High Temperature Uses
Complete Stock of 9-inch Standard Bricks, Tile and Cements Carried
Phone TUcker 3452
Abrasive Engineering Corporation
Refractory Division
NORTON COMPANY HEAVY DUTY REFRACTORIES
617 E. Third Street Los Angeles, Calif.

FIRE BRICK

THIS organization is the largest and oldest maker of Fire Brick west of St. Louis and offers a complete Fire Brick service to the Gas Industry. Standard sizes for—

LININGS—CHECKERS BOILER SETTINGS

are always carried in stock. Deliveries can be made quickly. If you require special sizes of Fire Brick, our plant is especially equipped to make them. Write or phone us for complete information.

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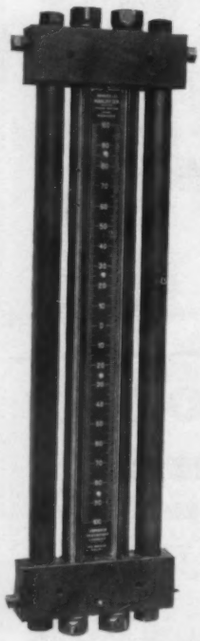


MODEL U
Manometer as illustrated is a real high pressure differential gauge. Glasses are guarded, visibility is perfect, mercury cannot be blown into line and 200 in. water range allows for plenty of surge. A perfect meter for steam, gas, air, oil and water flows.

MODEL R
Is a single tube gauge with 400 in. water and 30 in. mercury range. Can be calibrated to read volume directly.

MODEL M
Gauges are double tube for low pressure and vacuum work, 6 in., 12 in., and 18 in. water and mercury ranges.

JENSEN INSTRUMENT CO.
443 S. San Pedro St., Los Angeles, Calif.
950 Parker St., Sta. A, Berkeley, Calif.

Governors—

—Automatic
—Balance
—High and Low Pressure
—District
—Reverse Flow
—Fuel Gas
—Service
—Special

Oxide Purifying Material Equipment

Back Pressure Valves
Boosters
Photometers
Unison Telemetric Gauge
Gas Timers
Gauges
Street Department Tools
Gas Tape
Miller Packing

Connelly Iron Sponge & Governor Co.
NEW YORK CHICAGO
C. B. Babcock Co.
135 Bluxome St., San Francisco, Cal.

EVERETT MANAGER OF SALES FOR AMERICAN SEAMLESS TUBE

H. E. Everett, who has been connected with the American Seamless Tube Corporation of California at their Los Angeles office for the past several months, has been promoted to the position of manager of sales for this organization. Mr. Everett was associated with the Lucey Manufacturing Corporation for several years in both their plant and sales organization. He was later with the Buck & Stoddard organization at Los Angeles, and during much of this time Buck & Stoddard were distributors for the American Seamless Tube Corporation.

COLUMBIA GASOLINE ENTERS TEXAS GAS FIELDS

The Columbia Gasoline Company, operating several absorption natural gasoline plants in North Louisiana and elsewhere has entered the West Texas and Panhandle fields. The first plant of this company was recently finished and placed in operation in section 46, block 17 I. & G. N. survey, in the southeast quarter of the section. This plant is a charcoal absorption installation having a rated capacity of 6000 gallons daily.

CABOT, INC., TO BUY SKELLY GAS FOR CARBON BLACK

The Skelly Oil Company has announced that Godfrey L. Cabot, Inc. of Boston, manufacturers of carbon black, has contracted to purchase a minimum of $1,500,000 worth of waste gas in the Texas Panhandle in the first 10 years covered by the agreement. Cabot, Inc., is the largest producer of carbon black, which is produced solely from natural gas, and is practically indispensable in the rubber industry. The Texas Railroad Commission has approved the consumption of 50,000,000 cu. ft. of gas daily by Cabot, Inc., who expect to produce 75,000 pounds of carbon black daily.

ON SAFETY COUNCIL

T. J. Strickler, vice-president of the Kansas City Gas Company, was recently named second vice-president of the Kansas City Safety Council, in charge of the industrial division.

SMOKE ABATEMENT WORK GETS $252,000 IN ST. LOUIS

St. Louis, Mo., citizens have subscribed $252,000 to be used in a three-year campaign for smoke abatement. The Smoke Abatement League will conduct a school to teach correct methods of firing, special work will be undertaken with offending industrial plants, and there will be a school for janitors.

TEXANS WORRIED OVER GAS EXPORTS FROM STATE

Press dispatches from Austin state that the attorney general of Texas has been asked for an opinion on the right of the state of Texas to prevent exporting of natural gas produced in the state. The move is said to be prompted by the West Texas Chamber of Commerce and to be caused by the proposed piping of gas from the Texas Panhandle to Colorado and Kansas.

TEXAS POWER PLANTS HEAVY USERS OF GAS

Public utility power plants in Texas are large users of natural gas. For March of this year the total gas so used was almost two billion cubic feet, practically one-half the gas used for this purpose in the United States.

Largest Stripper Plant

(Continued from Page 33)

steam from the pumps is collected in a header and used for agitation in the stripper. This steam, after being condensed, in the coils of the partial condenser and separated from the reflux in the de-watering tank, flows up into the open box in which the coils lie and is evaporated and dissipated into the atmosphere. All the heat taken from the vapors in the partial condenser is dissipated in this manner as the cold water admitted to the box is also evaporated.

COMPRESSOR INSTALLATION

The compressor installation which was made by the J. B. Gill Corporation, compressor engineers of Long Beach, California, consists of two 200 H. P. Ingersoll-Rand direct connected two stage twins compressing to 400 pounds. A closed water system is used consisting of coils located in a separate cooling tower which is devoted to the cooling of the jacket water and the cooling of the compressed gas. These compressors take suction from the transformer and also from a vertical tank three feet in diameter and 12 feet tall into which the vapors from the various surge tanks discharge. This tank is equipped with a float-controlled valve for automatically discharging any condensate or oil which might get through into the absorption oil storage. Water for this cooling tower is circulated by centrifugal pumps electrically driven with steam pumps as a stand by.

Temperatures on the transformer are thermostatically controlled by a system worked out by the company engineers so that the whole plant is entirely automatic in operation.

The plant was put in operation the latter part of June and though at present it is running under a very light load, it is expected that within a short time as the load increases upon the line, the plant will be operating at full capacity.

$25 Shares

(Continued from Page 38)

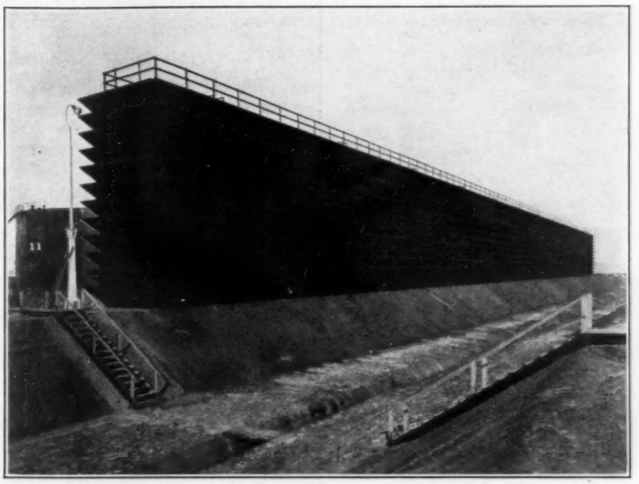
blocks, probably the great proportion of it in foreign hands—that is, outside the utility's immediate territory—and there would be no body of interested stockholders using the utility service. There would be few consumers thinking in terms of "my company"; there would be no repeat sales to small holders among the company's consumers; in short, there would be a total absence of the personal touch which the utility has come to enjoy in its financing.

As it is, the utility is in a position to select the body of its shareholders, to diffuse its securities rather than to concentrate them in the hands of a few large holders, interested only in company earnings. And it is able to protect the small investor while encouraging him to save. It is a common occurrence for a utility to advise a purchaser against buying beyond his power.

The utility enjoys a vantage point possessed by few industrial corporations in controlling the distribution of its stock, and the $25 share will go even farther in this desired direction.

PFISTER NOW WITH AKIN

A. J. Pfister, who has been connected with the sales department of the Bell Oil & Gas Company, Tulsa, Okla., for the past two years, has resigned to accept the position of manager of sales with the Akin Gasoline Company.



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The Arco Company

Paints—Varnishes—Enamels

CLEVELAND, OHIO

Eclipse Division

ECLIPSE Tank Paint

Benzol Manufacture *in* Portland

(Continued from Page 31)

The impurities which are removed from the gas with the benzol are principally destroyed by the action of the sulphuric acid in the refining process. One of these known as carbon bisulphide is removed in the distillation process, and experiments are now being conducted by county agricultural agents on its use for destroying the wild morning glory vine, which is a pest, especially in the wheat ranches of Eastern Oregon.

There seems to be an impression that the heat value of our gas is reduced by the removal of the benzol from it. This is not the case, as the 570 B.t.u. requirement of the Public Service Commission is at all times rigidly maintained, and the standard is the same as before the installation of the oil washing process.

In 1922 two of the most prominent Eastern firms of chemical equipment manufacturers were asked to bid on the apparatus and they sent their engineers to Portland to go into the proposition. On the basis of the information the contractor was able to make detailed specifications and binding guarantees of performance. The latter were met in every particular when the plant was placed in operation.

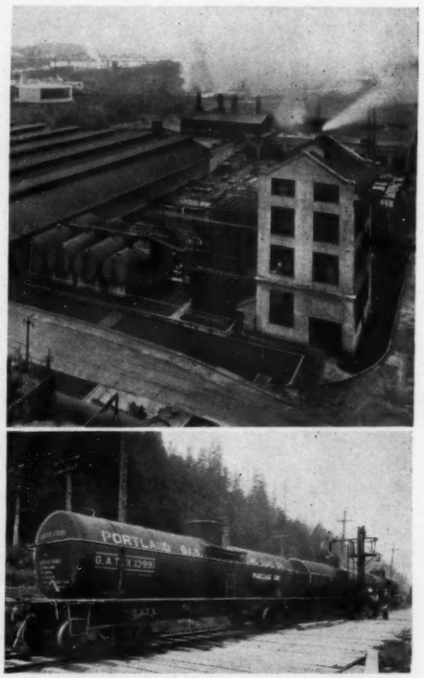
The construction of the oil washing plant, as the crude benzol recovery plant is known, was started in January, 1923, and completed in July, 1923. The construction of the light oil purification plant was started in April, 1923, and completed in July, 1923.

Since active operation began, in 1923, all expectations on plant performance have been exceeded, and the financial returns have been very gratifying. Disposal of the products of the plant has been very successful. The surplus not sold locally and on the Pacific Coast has been readily absorbed by Eastern firms for blending into motor fuel. In 1925 nearly 600,000 gallons were so disposed of, and Eastern sales in 1926 exceeded 500,000 gallons.

The advantages of benzol as a motor fuel are well known to those who have tried it, especially if they have kept account of the mileage. Greater mileage is obtained principally because benzol weighs more than gasoline. The power is proportional to the heat units in the fuel and as benzol is heavier, more heat units are contained in a gallon than in the same volume of gasoline. Using benzol by itself, provided the carburetor is adjusted to give the increased proportion of air for combustion that benzol requires, gives even more power and mileage than that obtained from a blend of gasoline and benzol.

The reason for the smoother operation and lack of detonation or "knocking" is that benzol has a slower rate of combustion than other motor fuels, i.e., the explosion in the cylinder of the motor is less sudden and its force is exerted on the piston for a greater proportion of the downstroke. This results in increased power, especially on the hills, and less wear on the bearings, as well as reducing vibration.

Since the demand for gasoline has increased it has been necessary for refiners to include more and more of the higher boiling fractions such as kerosene in gasoline. Although automobile designers have made improvements in carburetors to increase their ability to completely vaporize the fuel, nevertheless there is a considerable amount



Top: Portland oil-washing plant. Bottom: Tank cars being filled with benzol for shipment to Atlantic Coast

of these high boiling constituents, especially in cold weather, and when the motor is started, that do not vaporize and leak past the piston rings down into the lubricating oil in the crankcase, causing "crankcase dilution." When this occurs much of the value of the lubricating oil is destroyed. Benzol, which vaporizes more readily than gasoline, greatly reduces if not entirely eliminates this trouble, and also makes the motor start more easily. Deposits of carbon in the cylinders are much less, and the small amount of carbon formed is a soft variety that blows out with the exhaust gases.

In addition to the benzol a similar product called toluol is being produced, which on account of the demand for its use in the new quick-drying lacquers, commands a much higher price than benzol. During the war the price of toluol was $3.00 per gallon owing to the demand for use in the manufacture of high explosive TNT.

Toluol has a formula C_7H_8 and is a water white liquid with a sweet, aromatic odor similar to benzol. Its boiling point is 110°C. Benzol boils at 80°C. This is one of the reasons why it is used for lacquer manufacture, as the higher boiling point makes it dry a little slower. The difference in boiling points is what makes it possible to separate the toluol from the benzol in the process of distillation. The refining still is equipped with a rectifying column and a reflux condenser. By controlling the flow of water to the condenser the vapors of the higher boiling compounds such as toluol are condensed and run back into the still. The vapors of the lower boiling compounds pass the reflux condenser and are condensed to liquid form in the final condenser. After all the benzol has been distilled off the toluol vapor is allowed to pass the reflux condenser and enter the final condenser by cutting down the flow of water, which allows

the temperature in the condenser to rise. The rectifying column assists in performing the separation, but without a technical discussion which is beyond the province of this short article the manner of operation cannot well be described. Napthalene is also a by-product of benzol refining, and a good market has been developed for it as a soil insecticide. It is recovered by cooling the residue from the still, the napthalene forming as crystals on the surface.

The distribution of the products of the plant is made by tank car, tank truck and in drums. The large shipments of benzol to the Atlantic Coast have up to the present been made in tank cars at a very high freight cost. Our customer will have a tank steamer on the Pacific Coast this summer and a shipment of approximately 250,000 gallons, which would ordinarily have been distributed over a period of three months, will be made on this steamer. This large amount will be accumulated in a tank holding over 300,000 gallons.

Gasco Motor Fuel is blended by pumping gasoline, delivered at the plant in tank cars holding 10,000 gallons, simultaneously with the correct proportion of benzol into a 40,000 gallon tank, from which it is transferred to an elevated tank which permits filling the tank trucks by gravity. Our local sales of benzol outside of motor fuel are not large, as the use is almost entirely confined to the demands of the paint and tire manufacturers and repairers.

Shipments to California to the large rubber and paint manufacturers are in considerable volume and are made in tank cars. Some of our pure benzol, the highest grade manufactured, is used in the manufacture of a sanitary coating for cans in which fruit and meat products are packed.

In addition to the outgoing shipments, sulphuric acid in tank cars from California and caustic soda in steel drums from the Atlantic Coast by boat in carload quantities are received. These chemicals are used in the refining of benzol.

Elaborate precautions are taken to avoid fire and the most modern form of chemical foam fire extinguishers are provided. The refining plant is connected by electric circuit with the gas plant power house so that pulling switches will instantly sound a gong and the engineer can pull the fire whistle. Telephones, both city and private, are provided, so that the operators of the oil washing plant and refinery may keep in touch with each other and the rest of the plant.

The operation of both plants is carried on three shifts of eight hours each, one operator being on duty at each plant. On the day shift the foreman and a relief operator and laborer in addition to the regular operator are on duty. The two extra men attend to loading cars and drums, unloading acid, etc. The relief operator takes the place of regular operators if absent from sickness or other cause.

Careful thought in providing centralized control of the apparatus has made it possible to operate with a relatively small force. The foreman and operators were recruited largely from men who assisted in the original experiments and followed the construction of the plant, so that they are entirely familiar with all the details.

Very rigid chemical control over all the products before they are shipped is performed by the works chemists and nothing is allowed to leave the plant which does not in every way conform to the standard specifications of each grade. We have been informed that the motor fuel benzol shipped East is the best of its kind manufactured in the United States.

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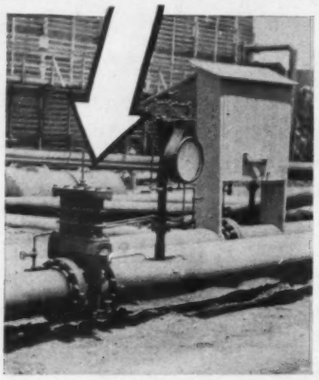

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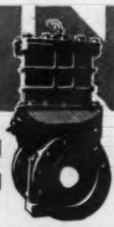
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SOUTH CHESTER TUBE CO.
Chester, Pa.

Give *the* Meter *a* Chance

(Continued from Page 23)

is generally traceable to failure on the part of the company to properly purify the gas before distribution. The presence of the condensible hydro-carbons and water vapor in themselves is not always detrimental. This is readily illustrated by the meter performance in New England where bleached diaphragms are frequent, due to benzol in gas and where no effort is made to remove water vapor; yet the diaphragms remain in good condition for a long period, generally about fourteen years. However, other companies may only obtain a diaphhragm life of from 3 to 8 years due to the presence of impurities in the gas. On the Pacific Coast it is of interest to note that one of the large companies operating on oil gas, while it encounters a great many bleached diaphragms and carries a normal water vapor content in its gas, enjoys highly satisfactory meter diaphragm life due chiefly to its vigilance in maintaining constant control over the oxygen and sulphur content of the gas being distributed. It can be stated in all fairness to both the meter and to the gas company that where operating conditions are favorable the meter performance can be kept upon a high standard and the meter will function in a manner highly satisfactory to both the company and to the consumer.

REMEMBER THESE POINTS

In order to obtain the best possible meter performance the following points should be given serious consideration on the part of the gas company:

Meters should leave the manufacturing plant or meter repair shop adjusted to give accurate measurement. Because they are scientific measuring instruments they should be handled with extreme care. Meters should be kept in an upright position at all times and the connections capped to prevent dirt from falling into the meter interior and interfering with its operation. In handling meters every effort should be made to avoid damaging the paint on the outside as this serves as a protection against the action of the elements.

Meters are designed to operate at slow speeds to give best results at their rated capacity. If the meter is not of sufficient size it may cause a restriction in gas flow during periods of peak demand. The meter will also be subjected to strain and excessive wear when overloaded. Such an installation will not give the long life and accurate registration normally possible when a meter of ample capacity is installed.

Fitters when installing meters should see that house lines are properly pitched and equipped with drip facilities to minimize the amount of condensation to be encountered at the meter. The meter should be set with proper alignment to avoid strained connections and to insure gas tight joints. Since a meter is set for a period of at least five years, generally, it justifies a little extra care and attention. Also leaks at connections cause complaint and may result in fire hazard.

AVOID EXTREME TEMPERATURE CHANGES

Meters should be set in locations where they are accessible for reading but sheltered from extreme temperature changes and from the action of the elements. They should be set at least six inches above the ground and away from walls or partitions. This will allow the meter to maintain a uniform temperature condition and prevent condensation

of products from the gas in the meter. When the meter bottom rests on the ground it is not only subjected to rapid deterioration due to corrosion but also the low ground temperature chills the meter base and as a result the warm gas striking the cold metal causes sweating or condensation. The accumulation of moisture in the meter causes corrosion of the metal parts and destruction of the diaphragm leather where it comes in contact with the metal parts and with the liquid condensate. The condensation products may accumulate to the point where they restrict the operation of the meter and interfere with service. Gas meters should not be expected to operate with liquids. The same action will take place when meters are placed close to a wall or near a furnace where radical changes in temperature occur.

Where meters are set out of doors on the ground or in sand and subjected to the hot rays of the sun by day and the chill fog or winds at night, it should be considered remarkable that they function for any period of time. One would hesitate to set a fine mantel clock out under conditions like that and expect it to keep good time and yet the gas meter which is made of cheaper material but also delicate, is expected to function for years under such conditions.

HANDICAPPING THE METER

The weathering rapidly develops external corrosion to ruin the meter case, the hot sun causes the oil to vaporize out of the diaphragm leather and form a gummy deposit on the valves to restrict their action. The cold night air on the meter chills it so that the gas when entering at a higher temperature than the meter, drops out its condensation products to harass the meter in the performance of its duty. To add further to the handicap under which such meters labor, they are ofttimes subjected to watering with the garden hose along with the flower garden and banked up with mud and sand. Such meters do not have a chance to work properly for very long.

The gas company should take every step economically possible to maintain the least possible amount of foreign matter in the gas. Proper plant equipment to minimize the amount of light oil and water vapor to be carried by the gas into the mains and services will greatly assist in avoiding the accumulation of these materials within meter compartments and assure a longer life in service and a better registration on the part of the meter. The greatest of care should be taken to avoid the possibility of sending out with the gas such impurities as hydrogen-sulfide and excessive amounts of cyanogen, as these constituents are the greatest offenders in the corrosion of meter parts and the deterioration of meter diaphragms. The gas company should maintain efficient meter repair shops for the purpose of keeping meter repair work at a high standard. Poor meter performance is often laid to the meter construction, whereas it is primarily due to the lack of knowledge or poor workmanship on the part of the meter repair men, which condition is often brought to the attention of meter manufacturers for an explanation, although the meter is, in itself, not at fault.

METER RECORDS

Proper records should be kept in regard to the meter's history and performance. The study of such records should always consider the length of time the meter has been in service and its age. Too often an attempt is made to compare meter performance between companies operating under dif-

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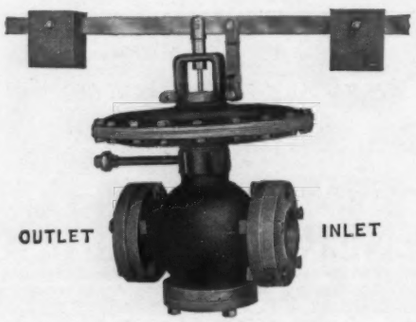

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ferent conditions. One company may have meters of old type and poor condition whereas the other company by replacement and rapid expansion in business may be operating with newer and better meter equipment.

Elaborate records and systems for keeping data are of little value if the basis upon which they are prepared is false. Poor workmanship and inefficient meter shop procedure will give high repair costs and poor performance regardless of the elaborateness of records kept. Starting with proper meter repair and proving room procedure, a gas company can then analyze meter conditions intelligently and take steps to improve them. For instance, a high percentage of D. R. and slow meters may indicate poor operating conditions at the plant with possible distribution of insufficiently purified gas. These conditions, if not remedied, will require a shorter change period for meters than would ordinarily be enjoyed. A high percentage of stuck meters may reflect poor workmanship in meter repair or bad policy in meter setting by exposure to elements or possibly excessive unsaturated condensible hydrocarbn content in the gas leaving the plant.

The company should make every effort to survey customer accounts to catch both slow and fast meter tendency before these get to the point where they cause a complaint on the part of the consumer. This will avoid explanations and loss of confidence in the meter and in the company itself. Every care should be taken to see that the meters are read properly in order to avoid high bill complaints and the necessity to explain that the consumer will not be overcharged and that the readings on the following month will adjust the situation. In the majority of cases the consumer is never convinced entirely to his satisfaction.

Company employees, particularly in the Service and Public Relations Departments, should be thoroughly familiar with the functioning of a gas meter in order to intelligently handle complaints and meter installations. A thorough knowledge of a gas meter will always lead to a greater respect for its operation and more careful consideration on the part of the employee in its handling.

Serving Industrial Users *in* Oklahoma City

(Continued from Page 26)

necessary money to put their boiler plants up in shape. Before we went into this work thoroughly, a great many of our large customers looked on their boiler rooms more as a necessary evil than anything else, but since going into it, the owners and superintendents of the plants are interested in the most minute detail concerning their boiler equipment. In fact, a great many of them are so well posted on what their respective plants should do that they are able to tell from their gas bills whether or not their men have been as careful as they should have been in operating the plant for the previous month. We have also found that the firemen and superintendents will be much more interested in a boiler room that is neat and clean than they will in one that is dirty, poorly lighted and unattractive looking.

At one time we held a night class of local firemen in conjunction with the Board of Education and believe that a great deal of benefit was derived from these lectures.

Selling *the* Utility

(Continued from Page 22)

Selling the employees is fundamental to selling the public. Too often this is overlooked. Give the employees an active part in the company's program, make them feel their responsibility in the company's general progress and development, take them into the full confidence of the company's management, acquaint the employees thoroughly with the history and development of the organization, pay them a reasonable amount for the extra service required—and the general employees of a public utility will respond beyond your fondest expectations and become your largest active force in selling the utility first.

Firing Face Brick

(Continued from Page 25)

is required for drying stiff mud brick.

Glazed or enamel brick are usually made from perfect cream brick. The surface of the brick must be smooth, free from checks and the edges sharp. Porosity is also an important factor to assist the glazing material to adhere to the brick's surface.

The enamel, which usually consists of mixtures of acids and bases so combined that they will melt to a glass at a temperature of 2100° F., is sprayed by hand on the edges of the brick to be exposed, by a small compressed air gun. The ware is then placed in the kiln on benches in such a manner that pieces do not touch one another, and firing is commenced.

This class of ware is still burned more generally in the down-draft muffle kiln either round or rectangular. However, with clean gas it is not essential, as first-quality ware has been produced by the usual open fire down-draft kiln.

The main reason for using the muffle kiln is that the kilns, having already been constructed in the time when coal or oil was used for fuel, are still serviceable.

Muffle kilns are constructed with an inner and outer chamber. The ware is placed in the inner chamber. The hot gases from the fire boxes pass into the outer chamber and penetrate the walls of the inner chamber, finding their way to the ware. With the heavier hydrocarbon fuels, this procedure is quite essential. The atmospheric condition of the burning chamber must be clean and free of unburned fuel, as the unburned carbon will rob the oxygen from the glazing material, causing defects in the finished product.

The use of the muffle kiln has been an effective safeguard against a reducing atmosphere within the kiln, owing to the fact that the heat must soak through the walls of the inner chamber and that the greater portin of the unburned fuel is drawn off by the stack with the products of combustion.

It has been proved that with the flexibility of a gas-fired furnace, first-class ware can be produced without the muffle and that a saving in fuel of about 25 per cent can be effected. About 6000 cu. ft. of 1100 B.t.u. gas and 40 hours time is required to burn one ton of glazed brick in the muffle type kiln.

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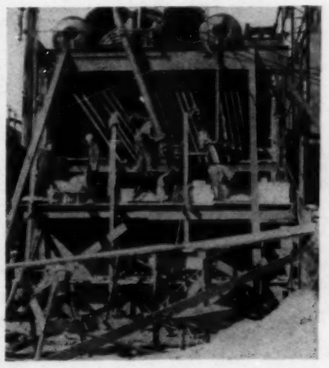

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Los Angeles
321 W. 3d St.
Seattle
939 Stewart Bldg.

GAS AN INDUSTRIAL ASSET

An industrial survey recently published by the industrial department of the Los Angeles Chamber of Commerce gives a full review of that community's manufacturing advantages, listing natural gas prominently as one of them.

CHELSEA COMPANIES ALLOWED TO REVAMP RATES

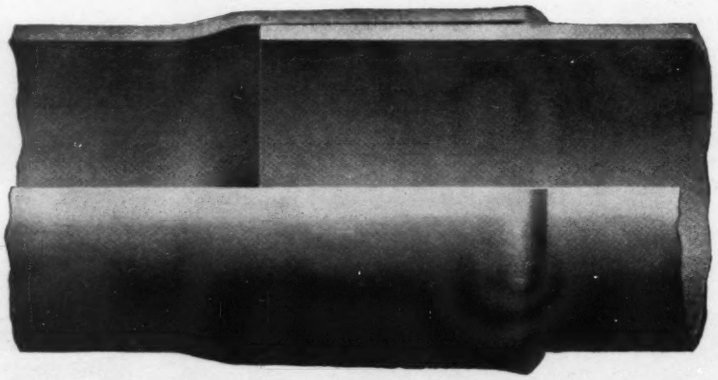
New rates amounting to 30 cents a thousand cubic feet for domestic and general use, and 27½ cents a thousand for gas supplied to the city water and light plant, have been allowed the Pressure Oil & Gas Company and the Unity Gas Company, serving Chelsea, Okla., by the corporation commission of the state.

EMPIRE WRINKLES CAMPAIGN PRODUCES RESULTS

One hundred and fifty suggestions directed toward the improvement of company operations in mechanical, office, customer and employee relationship were submitted by employees of the Empire Companies, Bartlesville, in a "new suggestions" campaign just closed. The first prize was won by Roy Corn, natural gas pipeline superintendent, for a "bull plug" which helps materially in the conservation of gas on leaks in large lines as well as reducing the risk ordinarily run by employees in making repairs in these breaks.

Out of the 150 new suggestions 52 were adopted and awards ranging from $5 to $100 made for same.

STRENGTH RESISTANCE
ASTCO
DURABILITY



AMERICAN SEAMLESS LINE PIPE

Higher Resistance Against Corrosion

To make "ASTCO" Pipe highly resistant to corrosion, acids and the chemical action frequently encountered both above and below the surface of the ground, the hot metal is soaked in a hot liquid bath of a special solution during the process of manufacture. This liquid is absorbed by and becomes a part of the metal itself, and its resistant qualities remain during the entire life of the pipe.

"ASTCO" Line Pipe is adapted to gas and all liquids, and is sufficiently strong to withstand the highest external and internal pressures. Furnished in all sizes up to 18-inch diameter, and random lengths averaging 40 feet.

Build For Permanence With "ASTCO"

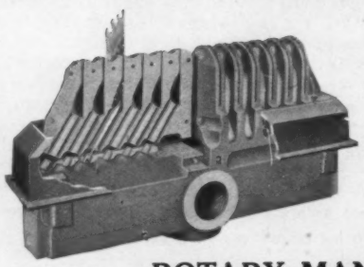
AMERICAN SEAMLESS TUBE CORPORATION OF CALIF.

Petroleum Securities Building
Los Angeles, California

535 Fifth Avenue
New York, N. Y.

1211 Neils Esperson Bldg.
Houston, Texas

R. M. C. Gas Burner



DEPENDABLE

under broad variations in gas heat values and pressures.

THIS QUALITY HAS A VITAL BEARING ON HEATING COSTS.

ROTARY MANUFACTURING CO.

5720 Long Beach Avenue **Los Angeles, California**

'UNACCOUNTED-FOR GAS'

Comments about *Western Gas* from our readers, old and new.

"While being on the accounting end of the game I am able to gather much useful information both from contributors and advertisements."—*C. O. Isbel,* Asst. Chief Acct., So. Counties Gas Co. of Calif., Los Angeles, Calif.

"*Western Gas* is an industrial periscope which enables the worker to see what is going on in his own particular field beyond his immediate environment."—*John B. Madgshon,* Holder Repairman, L. A. Gas & Elec. Corp., Los Angeles, Calif.

"We receive *Western Gas* regularly and find it of interest and value to us."—*Joe Carmichael,* Director, Iowa Committee on Public Utility Information, Des Moines, Iowa.

"I find some very interesting material in your book."—*M. A. Hardie,* Supt. Gas Dept., Producers & Refiners Corpn., Parco, Wyo.

"I receive and read *Western Gas* regularly and enjoy its contents."—*L. C. Olpin,* Auditor, Utah Gas & Coke Co., Salt Lake City, Utah.

"*Western Gas* already excels Eastern journals as the Western gas man's magazine. It cements our fraternity and crystalizes group consciousness. It creates a new level of esteem for the Pacific Coast gas industry."—*J. D. Van Valkenburgh,* Utilization Engineer, Portland Gas & Coke Co., Portland, Ore.

"A well edited and neatly constructed magazine; should be of great value to those interested in the gas industry."—*Robt. S.* Porter, Ins. Mgr. and Personnel, San Diego Cons. Gas & Elec. Corp., San Diego, Calif.

"*Western Gas* is just the book to keep us posted on the improvements and the up-to-dateness of our business."—*J. R. Hall,* Salesman, Coast Counties Gas and Electric Co., Santa Cruz, Calif.

"Best of all the gas journals; fills a long needed place in western gas practice."—*Van E. Britton,* Div. Supt., P. G. & E., Oakland, Calif.

"It is getting better all the time; I read it all. Publish more about the proper utilization of gas and less about generation."—*Jarad A. Hill,* Engr., Hunter & Hudson, San Francisco.

"You are doing a job that needs to be done for the Gas Industry in the West—keeping each other and the public informed—and doing it well."—*L. J. Peterson,* Dist. Mgr., Pac. Gas & Electric Co., Petaluma, Calif.

"I think it a well gotten up magazine—paper, printing and illustrations are good. It will undoubtedly be a great medium for boosting the gas industry and all business in connection therewith."—*W. T. Smith,* Adjuster, Southern Calif. Gas Co., Los Angeles.

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge.

Situations Wanted

Note: *Western Gas* will publish free of charge, under this heading, advertisements of situations wanted. Maximum length, 50 words; additional space at classified rates five cents per word per insertion. Copy should be neatly typewritten on one side of paper only, and should be mailed to reach *Western Gas* not later than the 20th day of the month prior to publication date.

A successful factory representative of gas appliances, 34 years of age, with splendid record of accomplishment, possessing personality, ability and unusual aggressiveness, on account of wife's health desires to locate in Pacific Coast States, and so wishes to open correspondence with responsible concern with view of making lasting and profitable connection. Successful experience as salesman and division sales manager. Prefer opportunity in sales management or business promotion department. Best of personal, business and financial references. Address Box A-11, care of *Western Gas*.

Natural Gas Man—Can install and operate gas plant, repair and test meters and gas wells. Has own bookkeeper; also assistant gas man who knows the business. Best of references. What have you to offer? Address Box A-6, care of *Western Gas*.

Gas man of 20 years experience with coal, water and oil gas, in both East and West. Has been superintendent of both operation and distribution for a number of years. Best of references. Address Box A-7, care of *Western Gas*.

Accountant and auditor—now employed, desires change. Is capable of taking complete charge of an office, installing modern accounting system and handling any other work in the various departments of a distributing company. Thirty-eight years of age, married and can give best of references. Address Box A-9, care of *Western Gas*.

SOUTH COAST GAS COMPANY TO BUILD AT OCEANSIDE

South Coast Gas Company has been authorized by the Railroad Commission of California to construct a gas plant at Oceanside, Calif. A contract for the plant has been executed, for $79,500, the total outlay authorized being $96,405. C. L. Murphy is secretary and manager of the company.

H. L. JONES FIRST VICE-PRES. FOR CITIES SERVICE CO.

Henry L. Jones, for the last two years chairman of the executive committee of Henry L. Doherty & Company, has been elected first vice-president of Cities Service Company. Mr. Jones has been with the Doherty interests since 1912.

For

Proven Performance

Low Cost of Upkeep

Use

Reliance Regulators

Reliance Manufacturing Company

Pasadena, California

Eastern Representative	Northwestern Representative	Mid-Continent Representative
Isbell Porter Co.	Northwest Gas & Electric Equipment Co.	Westcott & Greis
Newark, N. J.	Portland, Oregon	Tulsa, Okla., Dallas, Texas

WESTERN GAS
626 South Spring Street,
Los Angeles, California .....192.....

Starting with the next monthly issue, you may send WESTERN GAS to the undersigned. Upon receipt of invoice, remittance will be sent to cover (1 year $2.00) or (3 years $5.00).

Name ..... *Title* .....

Company .....

Address .....

City and State .....

Please Check

[ ] GAS COMPANY [ ] GAS APPLIANCES
[ ] NATURAL GASOLINE CO. [ ] MISCELLANEOUS

Subscription: 1 Year, $2.00; 3 Years, $5.00, in Advance

A WESTERN GUIDE to INDUSTRIAL PURCHASING

Readers interested in any articles not listed in these pages are cordially invited to advise *Western Gas* of their wants and every effort will be made to furnish a list of the proper manufacturers. Addresses of companies listed on these pages may be found by consulting their advertisements in this issue.

Absorption and Compression Plant Equipment
Baker Iron Works.
C. F. Braun & Co.
J. A. Campbell.
Chaplin-Fulton Mfg. Co.
Fluor Construction Co.
Jensen Instrument Co.
The E. A. Key Company
Southwestern Engineering Corp.
Western Pipe & Steel Co.

Absorption Towers
Baker Iron Works.
C. F. Braun & Co.
J. A. Campbell.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Abrasives
Abrasive Engineering Corp'n.

Adjustable Plugs
Lattimer-Stevens Co.
Western Pipe & Steel Co.

Agitators
Baker Iron Works.
Western Pipe & Steel Co.

Aluminum Bronze Powder for Paint
W. P. Fuller & Co.
Hill, Hubbell & Co.

Analyzers
C. F Braun & Co.
A. R. Maas, Laboratories.
Smith-Emery Co.

Annealers (Bar, Blank, Strip)
Pacific Meter Works.

Anti-Fluctuators
Pacific Meter Works.

Apparatus, Experimental Gas
The Alpha-Lux Co., Inc.
Pacific Meter Works.

Appraisals and Valuations
Smith-Emery Co.

Automobile Tires
Truck Tire Service Co.

Bags, Gas Main
C. B. Babcock Co.
Connelly Iron Sponge & Governor Co.
Mueller Co.
Safety Gas Main Stopper Co.
Semet-Solvey Engr. Corpn.

Barometers
Jensen Instrument Co.
Westcott & Greis, Inc.

Bench Iron Work
General Gas Light Co.

Blast Gates
Montague Pipe & Steel Co.
Semet-Solvay Engr. Corpn.

Blocks and Tiles, Fire Clay
The Alpha-Lux Co., Inc.
American Refractories Co.
Los Angeles Pressed Brick Co.
Semet-Solvay Engr. Corpn.
Stockton Fire Brick Co.

Blowers and Boosters
Ingersoll-Rand Co.

Blowpipes
Montague Pipe & Steel Co.

Boiler—Brickwork
J. N. J. Firebrick Co.
J. T. Thorpe & Son, Inc.

Boiler Equipment
E. A. Key Co.

Boiler Maker's Tools
E. A. Key Co.

Boilers, Gas-Fired
C. B. Babcock Co.
Baker Iron Works.
Montague Pipe & Steel Co.

Boiler Settings, Pipe and Boiler Insulation
Pioneer Paper Company.
J. T. Thorpe & Son, Inc.

Boilers, Waste Heat
Baker Iron Works.

Boilers, Water Tube
Baker Iron Works.
Montague Pipe & Steel Co.
Southwestern Engineering Corp.
Western Pipe & Steel Co.

Boxes
Baker Iron Works.
Semet-Solvay Engr. Corpn.

Brass (rods, sheets, tubes, wire)
Mueller Co.

Breakers
Ingersoll-Rand Co.

Breeching (Boiler and Stack)
Western Pipe & Steel Co.

Brick, Firebrick
Abrasive Engineering Corp'n.
The Alpha-Lux Co., Inc.
American Refractories Co.
Los Angeles Pressed Brick Co.
Semet-Solvay Engr. Corpn.
Stockton Fire Brick Co.

Brick, Firebrick—Installation
J. N. J. Firebrick Co.
J. T. Thorpe & Son, Inc.

Brushes, Wire Pneumatic
Abrasive Engineering Corp'n.
Ingersoll-Rand Co.

Buildings, Steel
Baker Iron Works.
Western Pipe & Steel Co.

Bunkers, Steel and Concrete
Western Pipe & Steel Co.

Burners, High Pressure
Lee B. Mettler.
Rotary Manufacturing Co.

Burners, Low Pressure
C. B. Babcock Co.
General Gas Light Co.
Johnson Gas Appliance Co.
Lee B. Mettler.
Payne Furnace & Supply Co.
Rotary Manufacturing Co.
Standard Gas Equipment Corp.

Burners—Oil
Rotary Manufacturing Co.

By-product Recovery Apparatus
Oliver Continuous Filter Co.
Semet-Solvay Engr. Corpn.

Calorimeter Accessories
Pacific Meter Works.

Calorimeters
The Alpha-Lux Co., Inc.
Pacific Meter Works.

Cases, Meter
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Casinghead, Gas Meters
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
The Foxboro Co., Inc.

Casing and Tubing (steel)
Montague Pipe & Steel Co.
Semet-Solvay Engr. Corpn.
South Chester Tube Co.

Casing—Iron
South Chester Tube Company

Cast Iron Pipe
Semet-Solvey Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Castings
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Cement
Abrasive Engineering Corp'n.
Stockton Fire Brick Co.

Cement, High Temperature
Stockton Fire Brick Co.

Cement—Plastic
Pioneer Paper Company.

Centrifugal Pipe
United States Cast Iron Pipe and Foundry Co.

Charging Machines (retort, etc.)
Semet-Solvay Engr. Corpn.

Checker Brick
Abrasive Engineering Corp'n.
American Refractories Co.
Los Angeles Pressed Brick Co.
Semet-Solvay Engr. Corpn.
Stockton Fire Brick Co.

Chemical and Gas Testing Apparatus
The Alpha-Lux Co., Inc.
Pacific Meter Works.
Stauffer Chemical Co.
Westcott & Greis, Inc.

Chemists, Analytical
A. R. Maas, Laboratories.
Smith-Emery Co.

Chimneys, Radial Brick
American Refractories Co.
Los Angeles Pressed Brick Co.
Stockton Fire Brick Co.

Chimneys, Radial Brick Installation
J. N. J. Firebrick Co.
J. T. Thorpe & Son, Inc.

Chutes (coal, coke, ash)
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Clamps and Sleeves, Pipe
Mueller Co.

Clamps, Service
Mueller Co.

Cleaners, Service
C. B. Babcock Co.
Pacific Meter Works.

Coal Gas Plants
Semet-Solvay Engr. Corpn.

Coal Tar Products and Chemicals
W. P. Fuller & Co.
A. R. Maas, Laboratories.

Cocks
C. B. Babcock Co.
Johnson Gas Appliance Co.
Lattimer-Stevens Co.
Merco Nordstrom Valve Co.
Mueller Co.
Geo. D. Roper Corporation.

Collectors, Dust
Western Pipe & Steel Co.
Semet-Solvay Engr. Corpn.

Compressors, Air
The C. & G. Cooper Co.
Ingersoll-Rand Co.
Oliver Continuous Filter Co.

Compressors, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, High Pressure
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Compressors, Portable
Ingersoll-Rand Co.

Condensers
Baker Iron Works.
C. F. Braun & Co.
Ingersoll-Rand Co.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.

Condenser Boxes
Baker Iron Works.

Condenser Tubes
Semet-Solvay Engr. Corpn.

Controllers
Jensen Instrument Co.
The Foxboro Co., Inc.

Controlling Devices, Electric
L. R. Teeple Co.

Controls, Air and Steam
Jensen Instrument Co.
C. F. Braun & Co.
The Foxboro Co., Inc.
L. R. Teeple Co.

Cooling Systems
Semet-Solvay Engr. Corpn.

Cooling Towers
C. F. Braun & Co.
J. A. Campbell
Fluor Construction Co.
J. B. Gill Corporation.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.

Counters, Revolution
Jensen Instrument Co.

Couplings
Pittsburgh Equitable Meter Co

Coverings (Tank, Boiler, Cold and Steam Pipe)
Pioneer Paper Company.

Cubic Foot Bottle
Pacific Meter Works.

Cutters, Pavement
Ingersoll-Rand Co.

Cutters, Pavement
Ingersoll-Rand Co.

Cylinders, Compressor
The C. & G. Cooper Co.
Semet-Solvay Engr. Corpn.

Dephlegmaters
C. F. Braun & Co.
J. A. Campbell
Southwestern Engineering Corp.
Semet-Solvey Engr. Corpn.
Western Pipe & Steel Co.

Diaphragms, Meter
Chaplin-Fulton Mfg. Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co

Diggers, Clay
Ingersoll-Rand Co.

Discharging Machines (retort, etc.)
Semet-Solvay Engr. Corpn.

Displacement System, Tar
Semet-Solvey Engr. Corpn.

Door, Clean-out
Baker Iron Works.
Semet-Solvay Engr. Corpn.

Drills
Ingersoll-Rand Co.
Mueller Co.

Drill Pipe—Iron
South Chester Tube Company

Drill Pipe—Steel
South Chester Tube Company

Dryers
Payne Furnace & Supply Co.

Elevators
Baker Iron Works.

Engineers and Engineering Service
J. A. Campbell
J. B. Gill Corporation.
A. R. Maas, Laboratories.
Smith-Emery Co.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Engines, Diesel
The C. & G. Cooper Co.

Engines, Gas
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Oil
The C. & G. Cooper Co.
Ingersoll-Rand Co.

Engines, Steam
Ingersoll-Rand Co.

Evaporating Apparatus
C. F. Braun & Co.
United States Cast Iron Pipe and Foundry Co.
Southwestern Engineering Corp.

Exchangers, Heat
Baker Iron Works.
C. F. Braun & Co.
J. A. Campbell
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Exhausters
Ingersoll-Rand Co.
United States Cast Iron Pipe and Foundry Co.

Experimental Apparatus
Pacific Meter Works.

Extractors
Semet-Solvay Engr. Corpn.

Faucets, Drain
Mueller Co.

Felt—Deadening
Pioneer Paper Company.

Filters
Oliver Continuous Filter Co.
United States Cast Iron Pipe and Foundry Co.

Fire Clay and Products
The Alpha-Lux Co., Inc.
American Refractories Co.
Los Angeles Pressed Brick Co.
Stockton Fire Brick Co.

Fire Brick Contractors
J. T. Thorpe & Son, Inc.
Stockton Fire Brick Co.

Fittings
Semet-Solvay Engr. Corpn.
United States Cast Iron Pipe and Foundry Co.

Fixtures, Lighting (Domes, Portables, etc.)
C. B. Babcock Co.
Welsbach Company.

Feed Water Heaters
C. F. Braun & Co.
Southwestern Engineering Corp.

Fire Brick
Abrasive Engineering Corp'n.
The Alpha-Lux Co., Inc.
American Refractories Co.
Los Angeles Pressed Brick Co.
Stockton Fire Brick Co.
Semet-Solvay Engr. Corpn.

Flanges
Montague Pipe & Steel Co.
Pittsburgh Equitable Meter Co
Semet-Solvay Engr. Corpn.
Westcott & Greis, Inc.

Floodlights

Flooring—Industrial
Pioneer Paper Company.

Forgings
Baker Iron Works.
Payne Furnace & Supply Co.
Pacific Gas Heating Co.
Geo. D. Roper Corporation.
J. T. Thorpe & Son, Inc.

Furnaces, Floor
Payne Furnace & Supply Co.
Pacific Gas Heating Co.

Furnaces, Lead Melting
C. B. Babcock Co.
Johnson Gas Appliance Co.
Mueller Co.
Payne Furnace & Supply Co.

Gas Analysis Apparatus
The Foxboro Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.

Gas Masks
Safety Gas Main Stopper Co.

Gas Main Tapping & Drilling Machines
Mueller Co.

Gaskets
The E. A. Key Company
Pittsburgh Equitable Meter Co
Safety Gas Main Stopper Co.
Semet-Solvay Engr. Corpn.

Gasket Compound
W. P. Fuller & Co.
E. A. Key Co.

Gasometer
Pacific Meter Works.
Semet-Solvay Engr. Corpn.

Gas Pipe Line Construction
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Gauges
The Alpha-Lux Co., Inc.
The Foxboro Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.
Pittsburgh Equitable Meter Co
Semet-Solvay Engr. Corpn.
Westcott & Greis, Inc.

OUTWIT *the demon* CORROSION!

Preservation of metals demands scientifically-prepared primers.
Three distinct types are prepared by W. P. Fuller & Co.:

Chromate Metal Primer

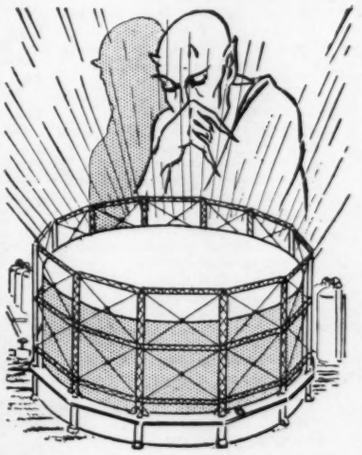
This primer gives maximum density of film with moisture resistance and strong adhesive qualities. Succeeding coats key tightly to its semi-gloss surface. Valuable as an undercoat for Ful-Lumina (aluminum paint) and "4200", fume-resisting paint.

Premier Red Lead Paint

Wherever engineers recommend red lead, this excellent primer may be depended upon.

Fuller Red Lead Graphite Paint

A finely-balanced combination of graphite and red lead retaining the excellent metal-protecting properties of both. The vehicle is a combination of moisture-proof oils, including China wood oil, giving an elastic film that adheres perfectly.



Industrial Bulletin Series for Engineers

Sent on request to those interested. (No. 8 deals with Special Paints for Gas Plants).

Technical Service

You are invited to present your special paint problems to our Technical Service Department. Upon request, this Department will survey your painting needs, make common-sense recommendations applying to your conditions. No charge—no obligation.

W. P. FULLER & CO.
301 Mission Street, San Francisco
Branches in 28 Pacific Coast Cities . . Factories in San Francisco . . . Los Angeles . . . Portland
Distributors of Valspar on the Pacific Coast

FULLER
INDUSTRIAL PAINT PRODUCTS
Since 49

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The BARTLETT HAYWARD CO.
BALTIMORE *Engineers and Founders* NEW YORK

DESIGNERS AND BUILDERS
OF
COMPLETE COAL GAS PLANTS
CARBURETTED WATER GAS PLANTS
BY-PRODUCT PLANTS
DE BROUWER CHARGING AND DISCHARGING MACHINES
SALT WATER AND FRESH WATER CONDENSERS
PURIFIERS
SHAVING SCRUBBERS
CENTRIFUGAL VERTICAL TYPE SCRUBBERS
STEEL TANKS
VERTICAL WASTE HEAT BOILERS

GAS HOLDERS

Gauges, Steam
Jensen Instrument Co.
Semet-Solvay Engr. Corpn.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Gauges, U Type
C. B. Babcock Co.
Jensen Instrument Co.
Lee B. Mettler.
Pacific Meter Works.
Safety Gas Main Stopper Co.
Semet-Solvay Engr. Corpn.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Generators, Water Gas
Baker Iron Works.
Semet-Solvay Engr. Corpn.

Glassware
Westcott & Gries, Inc.

Governors
C. B. Babcock Co.
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Governor Co.
Pacific Meter Works.
Reynolds Gas Regulator Co.
Sprague Meter Co.
Semet-Solvay Engr. Corpn.
Westcott & Greis, Inc.

Hammers
Ingersoll-Rand Co.

Hanger, Meter
Mueller Co.

Hangers, Iron and Steel
Baker Iron Works.

Heaters
C. B. Babcock Co.
Baker Iron Works.
C. F. Braun & Co.
General Gas Light Co.
New Way Mfg. Co.
Pacific Gas Heating Co.
Payne Furnace & Supply Co.
Welsbach Company.

Heaters, Floor
General Gas Light Co.
Pacific Gas Heating Co.
Payne Furnace & Supply Co.

Heaters, Wall
C. B. Babcock Co.
General Gas Light Co.
Pacific Gas Heating Co.
Payne Furnace & Supply Co.

Heat Exchangers
Baker Iron Works.
C. F. Braun & Co.
Southwestern Engineering Corp.
Semet-Solvey Engr. Corpn.
Western Pipe & Steel Co.

Heat Interchangers
C. F. Braun & Co.
Southwestern Engineering Corp.
Semet-Solvay Engr. Corpn.
Western Pipe & Steel Co.

Hoists
Ingersoll-Rand Co.

Holders
Baker Iron Works.

Holders, High Pressure
Baker Iron Works.
Western Pipe & Steel Co.

Hoppers
Montague Pipe & Steel Co.

Hose, Air
Ingersoll-Rand Co.

Hot Plates
C. B. Babcock Co.
Johnson Gas Appliance Co.
Geo. D. Roper Corporation.

Hygrometers
Jensen Instrument Co.
The Foxboro Co., Inc.
Westcott & Greis, Inc.

Incinerators
C. B. Babcock Co.
Baker Iron Works.
J. T. Thorpe & Son, Inc.
Western Pipe & Steel Co.

Incinerator Brickwork
J. N. J. Firebrick Co.
J. T. Thorpe & Son, Inc.

Indicators
Westcott & Greis, Inc.

Instruments (Measuring, Testing and Recording)
The Alpha-Lux Co., Inc.
Jensen Instrument Co.
Pacific Meter Works.
The Foxboro Co., Inc.
Semet-Solvay Engr. Corpn.
Westcott & Greis, Inc.

Insulating Materials
Beacon Water Heater Co.
W. P. Fuller & Co.
Pioneer Paper Company.
Stockton Fire Brick Co.

Joint Runners Asbestos
Safety Gas Main Stopper Co.

Kilns
J. T. Thorpe & Son, Inc.
Western Pipe & Steel Co.

Kilns—Brickwork
J. N. J. Firebrick Co.

Laboratory Supplies
Mueller Co.
Westcott & Greis, Inc.

Ladles, Hot Metal
Mueller Co.

Lamps
C. B. Babcock Co.
General Gas Light Co.
Welsbach Company.

Lighters
C. B. Babcock Co.
Tappan Stove Co.

Lighting Incidentals
C. B. Babcock Co.
Welsbach Company.

Line Pipe—Iron
South Chester Tube Company

Line Pipe—Steel
Amer. Seamless Tube Corp.
South Chester Tube Company

Linings—Brickwork
J. N. J. Firebrick Co.
J. T. Thorpe & Son, Inc.

Linings—Car
Pioneer Paper Company.

Main, Bags
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Mains, Street
United States Cast Iron Pipe and Foundry Co.

Main, Stopper
C. B. Babcock Co.
Mueller Co.
Safety Gas Main Stopper Co.

Mantles, Gas Lighting
C. B. Babcock Co.
General Gas Light Co.
Welsbach Company.

Manometers
J. A. Campbell
Jensen Instrument Co.
Lee B. Mettler.
Westcott & Greis, Inc.

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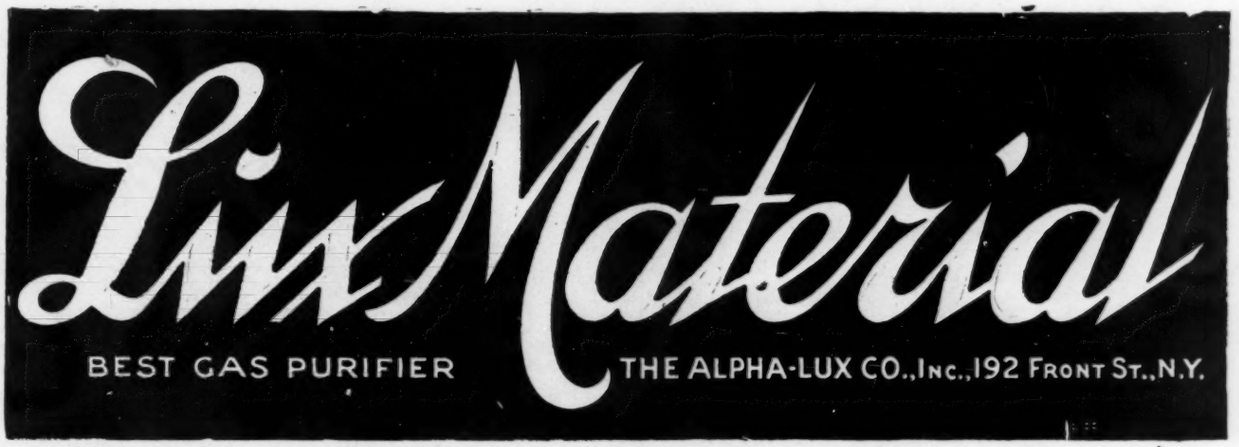

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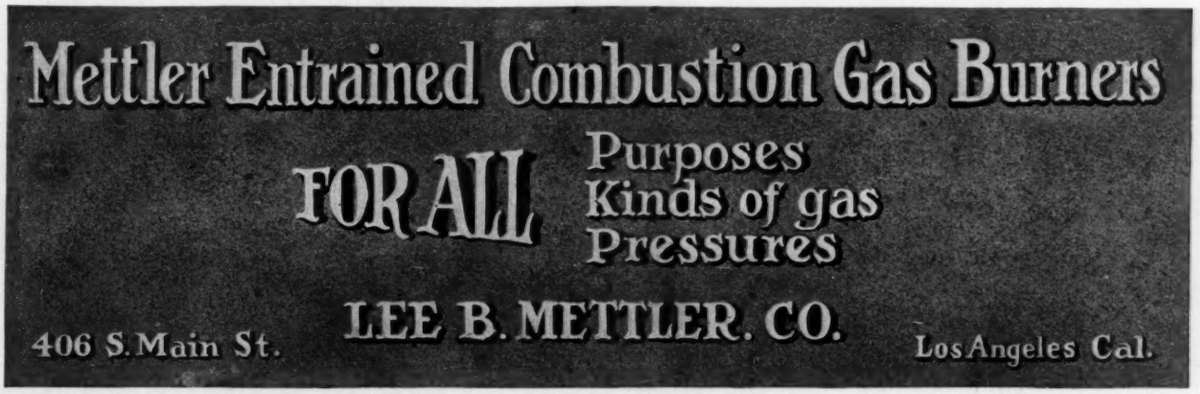

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Abrasive Engineering Corp. 63
The Alloys Co. 8
The Alpha-Lux Co., Inc. 79
American Gas Products Corp. 9-10-11-12
American Seamless Tube Co. 72
The Arco Company 66
C. B. Babcock Co. 70
The Bartlett Hayward Co. 75
Beacon Water Heater Co. 62
C. F. Braun & Co. 3
J. A. Campbell 60
Chaplin-Fulton Mfg. Co. 70
Cleveland Trencher Co. 6
Connelly Iron Sponge Co. 64
C. & G. Cooper Co. ..... —
Copper & Brass Research Assn. ..... —
The Detroit Vapor Stove Co. ..... *Third Cover*
The Estate Stove Co. 45-46-47-48
Everlasting Paint & Sales Co. 63
The Foxboro Co., Inc. 8
Fluor Construction Co. 65
W. P. Fuller Co. 75
General Gas & Light Co. 51
Hill Hubbell & Co. 13
Ingersoll-Rand Company ..... —
Jensen Instrument Co. 64
Johnson Gas Appliance Co. 62
E. A. Key Company 71
Lattimer-Stevens Co. ..... *Fourth Cover*
Los Angeles Pressed Brick Co. 64
Arthur R. Maas 68
Merco Nordstrom Valve Co. ..... *First Cover*
Lee B. Mettler Co. 79
Montague Pipe & Steel Co. 65
Chas. C. Moore & Co. 69
Mueller Co. 7
New Way Mfg. Co. 54
Oliver Continuous Filter Co. 77
Pacific Gas Radiator Co. 61
Pacific Gas & Electric Co. 16
Pacific Meter Works 18
Payne Furnace & Supply Co., Inc. 56
Pioneer Paper Co. 67
Pittsburgh Equitable Meter Co. 15
Reliance Manufacturing Co. 73
Reynolds Gas Regulator Co. 17
Robinson Orifice Fitting Co. 68
George D. Roper Corporation 53
Rotary Manufacturing Co. 72
Safety Gas Main Stopper Co. 14
Shaffer-Welch Sales Corp. 58
Semet-Solvay Eng. Corp. 20
Smith-Emery Co. 56
South Chester Tube Co. 68
Southwestern Engineering Corp. 1
Sprague Meter Company 77
Standard Gas Equipment Co. 55
Stauffer Chemical Co. 79
Stockton Fire Brick Co. 69
W. W. Strickler & Bros. 60
Superbo Mfg. Co. 52
Tappan Stove Company ..... —
L. R. Teeple Company 19
J. T. Thorpe & Son 71
Truck Tire Service Co. 4
U. S. Cast Iron Pipe and Foundry Co. 5
Welsbach Company 57
Westcott & Greis, Inc. ..... —
Western Pipe & Steel Co. 67
The Wilcolator Co. 59

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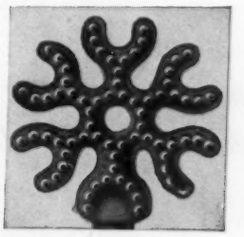

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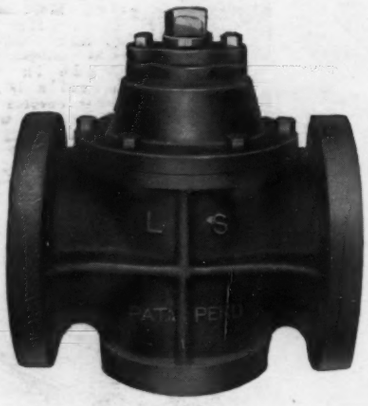

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